SBC81820

Socket 478 Full-size
All-in-One
CPU Card Series

User's Manual

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ESD Precautions

Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This helps to discharge any static electricity on your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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Chapter 1
Introduction

1.1 General Description

The **SBC81820** CPU card is an industrial grade CPU card incorporating the Intel 82845 ChipSet and the SMI Lynx EM4+ (SM721) PCI VGA controller, both ensuring its compatibility with PCI bus passive backplanes. Its 6-layer structure reduces signal noise and built-in power management feature. These advanced concepts along with the PCI Local Bus architecture bring outstanding performance to Windows-based applications.

Designed for the professional embedded developers, the Socket478 all-in-one **SBC81820** CPU card is virtually your ultimate one-step solution to various applications.

1.2 Specifications

- **Chipset:** Intel 82845
- **CPU Socket:** Socket478
- **CPU:** Intel Socket478 Celeron/Pentium 4
- **L2 Cache:** Integrated in CPU
- **BIOS:** Award 4MB PnP Flash BIOS
- **System Memory:**
  - 3 x 168-pin DIMM sockets
  - Maximum up to 3GB SDRAM
- **IDE Interface:** 2 bus mastering EIDE up to four devices, Ultra DMA 100 supported
- **FDD Interface:** Supports up to 2 drives
- **Serial Ports:** Two 16550 UARTs ports with 16 byte as one RS-232 and one RS-232/422/485
- **Parallel Ports:** One parallel port with ECP/EPP/SPP supported
- **VGA Controller:**
  - AGP interface controller with onboard 4MB SDRAM
  - VGA chipset SMI Lynx EM+ supporting CRT/LCD displays
  - Supports up to 1600x1200x64K colors resolution on non-interlaced CRT monitors
- **Ethernet:**
  - Controller: Integrated in 82801BA I/O Controller Hub (ICH*2) & dual Intel® 82559
  - Supports triple LAN, each with 10BASE-T and 100BASE-TX, triple RJ45 output
  - Wake On LAN support

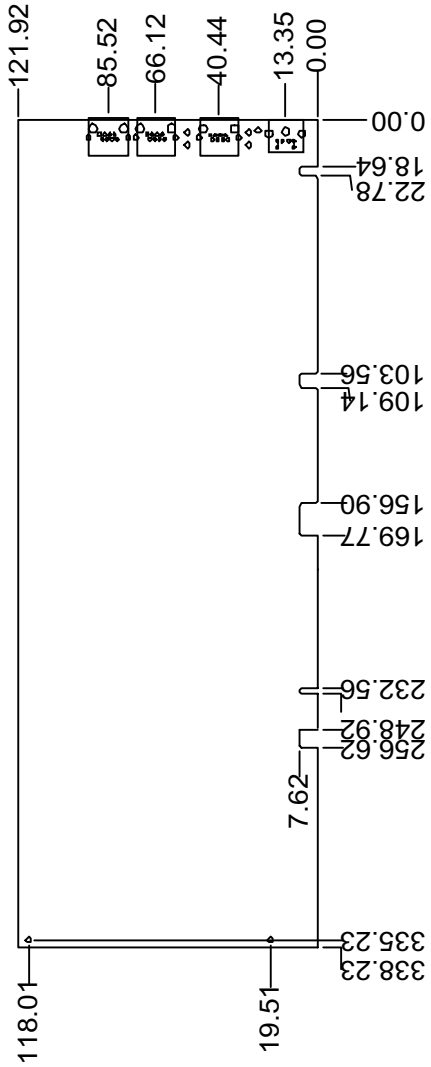
- **USB Interface:** 2 USB ports; USB Spec. Rev. 1.1 compliant
- **IrDA:** 1 IrDA pin-header for wireless communication
- **Hardware Monitoring:** Controller: Winbond W83627HF-AW detection of CPU temperature, System temperature, Power failure and Fan speed.
- **Watchdog Timer:**
  - Generates a system reset
  - Software programmable time interval and jumper selectable
  - 64 levels, 0.5~8/5~80/50~800/100~1600 seconds
- **SSD:** Supports M-Systems DiskOnChip 2000 serials
- **Dimensions:** 122(W) x 335(L) mm

NOTE: *Specifications are subject to change without notice.*

1.3 Utilities Supported

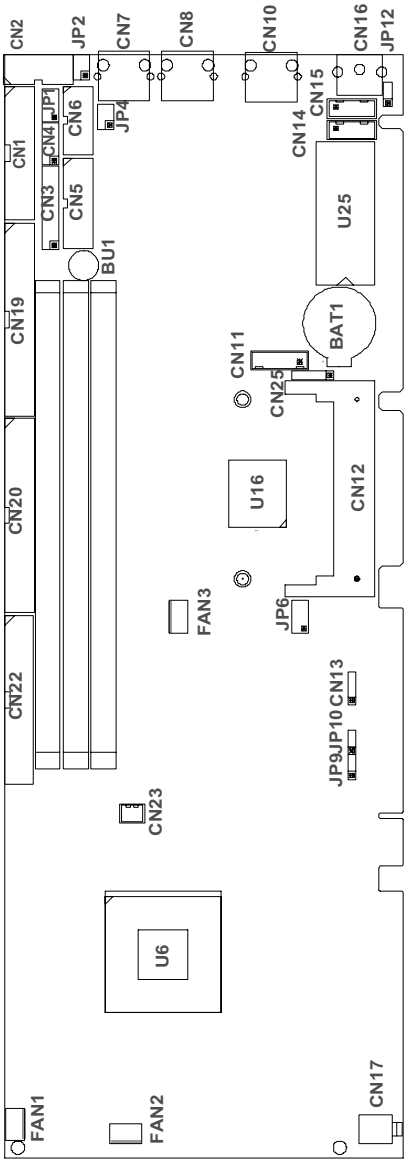
- Intel 82845 Utility and Drivers
- Ethernet Utility and Drivers
- VGA Drivers

1.4 Board Dimensions



Chapter 2
Jumpers and Connectors

2.1 Board Layout



2.2 Jumper Settings

Making the proper jumper settings configures the **SBC81820** to match the needs of your application. The following summary table lists all onboard jumpers and their corresponding functions and/or default settings.

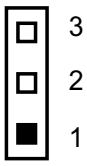
Jumper	Default Setting	Jumper Setting
JP1	COM2 Mode Setting: RS232	Short 1-2
JP2	COM2 Mode Setting: RS232	Short 3-5, 4-6
JP4	COM2 Mode Setting: RS232	Short 3-5, 4-6
JP6	DiskOnChip Memory Segment D6000-D7FFF	Short 7-8
JP9	CMOS Clear Jumper: Normal Mode	Short 1-2
JP10	Watchdog Trigger Mode: Disabled	Open
JP12	Reserved	Short 1-2

2.2.1 CMOS Clear Jumper: JP9

Options	Settings
Clear CMOS	Short 2-3
Normal (default)	Short 1-2

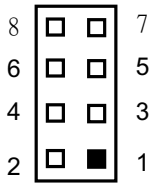
2.2.2 Watchdog Trigger Mode Setting: JP10

The watchdog timer is an indispensable feature of the **SBC81820**. It has a sensitive error detection function and a report function. When the CPU processing comes to a halt, the watchdog either generates a NMI or resets the CPU.



Options	Setting
NMI	Short 1-2
RESET	Short 2-3
Disabled	Open (default)

2.2.3 DiskOnChip Memory Segment: JP6

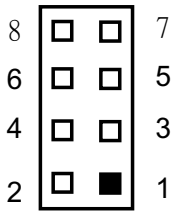


Options	Settings
D0000 – D1FFF	Short 1-2 (default)
D2000 – D3FFF	Short 3-4
D4000 – D5FFF	Short 5-6
D6000 – D7FFF	Short 7-8

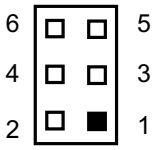
2.2.4 COM2 RS232/422/485 Settings: JP1,JP2,JP4

COM2	JP1	JP2	JP4
RS-232 (default)	Short 1-2	Short 3-5, 4-6	Short 3-5, 4-6
RS-422	Short 3-4	Short 1-3, 2-4	Short 1-3, 2-4
RS-485	Short 5-6, 7-8	Short 1-3, 2-4	Short 1-3, 2-4

JP1



JP2 and JP4



2.3 Connectors

The connectors allow the CPU card to connect with other parts of the system. Some problems encountered by your system may be a result from loose or improper connections. Ensure that all connectors are in place and firmly attached. The following table lists the function of each connector on the **SBC81820**. Their corresponding pin assignments are described in Chapter 4 and Appendix B.

Connectors	Label	Connectors	Label
Printer Port Connector	CN1	Primary IDE Connector	CN19
COM1	CN2	Secondary IDE Connector	CN20
General Output Connector	CN3	FDD Connector	CN22
USB Connector	CN4	IrDA Connector	CN25
CRT Connector	CN5	Fan Power Connector 1	FAN1
COM2	CN6	Fan Power Connector 2	FAN2
Ethernet Connector 1 (SBC81820VEE & VEEE Only)	CN7	Fan Power Connector 3	FAN3
Ethernet Connector 2 (SBC81820VE, VEE & VEEE Only)	CN8	168-Pin Memory Socket 1	DIMM1
Ethernet Connector 3 (SBC81820 VEEE Only)	CN10	168-Pin Memory Socket 2	DIMM2
ATX SB5V Power Connector	CN11	168-Pin Memory Socket 3	DIMM3
Mini-PCI Connetcor	CN12	Socket 478 CPU Socket	U6
PS/2 Mouse Connector	CN14	System BIOS	U16
PS/2 Keyboard Connector	CN15	DiskOnChip® Socket	U25
Keyboard/Mouse Connector	CN16	Internal Battery	BAT1
ATX12V CPU Power Connector	CN17	Internal Buzzer	BU1
AXIOMTEK LCD Interface	CN18		

NOTE: *1. SBC81820VEEE lan1 and lan2 is intel 82559, lan3 is intel 82562.*
2. SBC81820VEE lan1 and lan2 is intel 82559.
3. SBC81820VE lan1 is intel 82562.

Chapter 3
Installation

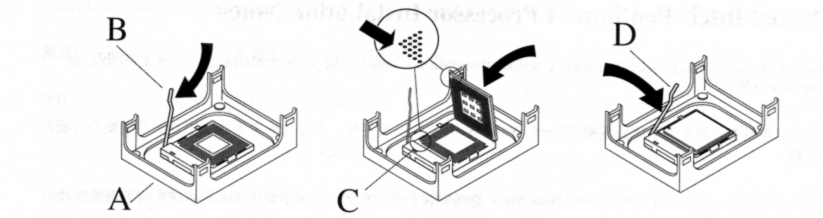
This chapter describes the hardware installation procedures on the **SBC81820** all-in-one Socket478 CPU card. The following is a list of typical peripherals required to build a minimum system:

- Power supply and passive backplane
- IBM™ PC/AT keyboard
- Display monitor
- Floppy or hard disk with MS-DOS or Flash Disk emulator

3.1 System Memory

The **SBC81820** industrial CPU card supports one 168-pin DIMM (Dual In-line Memory Module) socket for a maximum total memory up to 3GB.

3.2 CPU Installation



1. Open the socket handle (B). Install the processor by carefully aligning the pins to the socket (C). Close the socket handle (D).
2. Install CPU heatsink on the retention mechanism (A) following the heatsink manufacturer's installation instructions.

3.3 Configuring Power Supply

3.3.1 ATX Power Supply

Follow these instructions if the system has an ATX power supply installed.

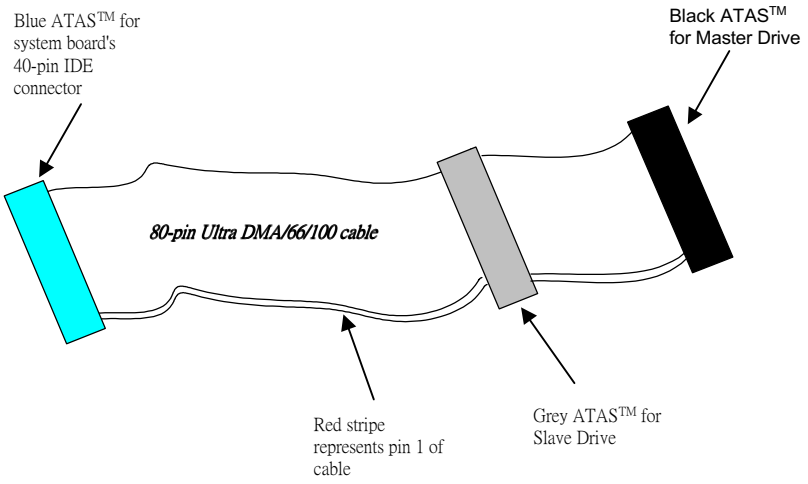
1. Install the ATX Power Control Connector cable to the designated ATX power control connector on your backplane. The ATX Power Control Connector cable is a 6-pin cable that comes with the **AXIOMTEK BACKPLANE** packaging.

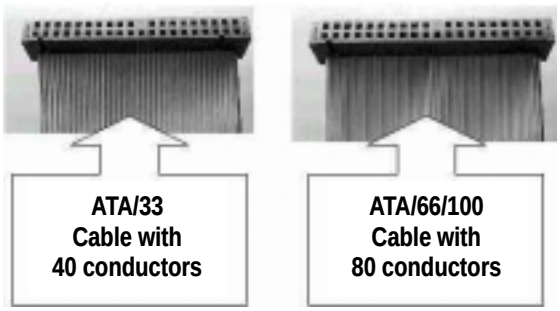
3.3.2 AT Power Supply

When using an AT power supply in your system, don't need the ATX Power Control Connector cable.

3.4 Ultra DMA/66/100 Drive Installation

To accommodate the fast transfer rate of Ultra DMA/66/100, an 80-conductor cable (with 40 pin connectors on both ends) is necessary when installing Ultra DMA/66/100 drives. The **SBC81820**, on this aspect, can support a total of 2 Ultra DMA/66/100 drives. It is through the IDE Connector (**CN6**) where the 80-conductor cable is connected. The diagram below illustrates the proper installation procedure, including color coding of connectors, of the 80-conductor cable.


Blue ATAS™ for system board's 40-pin IDE connector
Black ATAS™ for Master Drive
80-pin Ultra DMA/66/100 cable
Red stripe represents pin 1 of cable
Grey ATAS™ for Slave Drive



3.5 Completing Installation

To complete the installation, follow the steps listed below.

1. Make sure the power is OFF.
2. Set the configuration jumpers according to the jumper settings on Chapter 2.
3. Install the **SBC81820** CPU card into one of the slots on the passive backplane. You may allow the **SBC81820** to stand alone as a single board computer.
4. Connect the I/O cables and peripherals, i.e. floppy disk, hard disk, monitor, keyboard, power supply and etc. to the CPU board.

   NOTE: *The color of pin one is usually red or blue, while others are gray.*

5. Turn ON the system power.

Chapter 4
Hardware Description

This chapter gives a detailed explanation of the hardware features onboard the **SBC81820** all-in-one Socket478 CPU card.

4.1 Microprocessors

The **SBC81820** supports Intel Celeron/Pentium 4 CPUs. Systems based on these CPUs can be operated under UNIX, OS/2, Linux, Windows NT/2000/XP, Windows 98/ME and MS-DOS environments. The system's performance depends on the installed CPU on the board.

4.2 BIOS

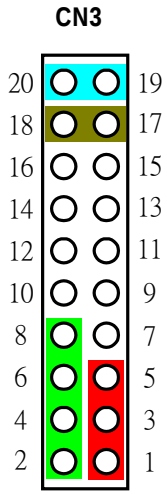
The system BIOS used in **SBC81820** is Award Plug and Play BIOS. The **SBC81820** contains a single 4MB Flash EPROM. For more detailed information, refer to Chapter 8 for a complete description of the BIOS setup utility and the available features accompanying it.

4.3 I/O Port Address Map

The CPU card communicates via I/O ports. It has a total of 1KB port addresses that can be assigned to other devices via I/O expansion cards.

Address	Devices
000-01F	DMA controller #1
020-03F	Interrupt controller #1
040-05F	Timer
060-06F	Keyboard controller
070-07F	Real time clock, NMI
080-09F	DMA page register
0A0-0BF	Interrupt controller #2
0F0	Clear math coprocessor busy signal
0C0-0DF	DMA controller #2
0F1	Reset math coprocessor
0F8-0FF	Math processor
120	Disable watchdog timer operation (read)
121	Enable watchdog timer operation (read)
122	Watchdog
1F0-1F8	Fixed disk controller
200-207	Game port
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel port #1
3B0-3BF	MDA video card (including LPT1)
3C0-3CF	EGA card
3D0-3DF	CGA card
3F0-3F7	Floppy disk controller
3F8-3FF	Serial port #1 (COM1)
2F8-2FF	Serial port #2 (COM2)

4.4 General Output Connector:CN3



Power LED

This 3-pin connector, designated at ***Pins 1, 3,*** and ***5*** of ***CN3***, connects the system power LED indicator to its respective switch on the case. ***Pin 1*** is +, and ***pin 5*** is assigned as -. The Power LED lights up when the system is powered ON.

External Speaker and Internal Buzzer Connector

Pins 2, 4, 6, and ***8 of CN3*** connect to the case-mounted speaker unit or internal buzzer. ***Short pins 4-6*** when connecting the CPU card to an internal buzzer. When connecting an external speaker, set these jumpers to ***Open*** and install the speaker cable on ***pin 8*** (+) and ***pin 2*** (-).

System Reset Switch

Pins 17 & ***18*** of ***CN3*** connect to the case-mounted reset switch and allow rebooting of your computer instead of turning OFF the power switch. This is a preferred method of rebooting in order to prolong the life of the system's power supply.

HDD Activity LED

This connector extends to the hard drive activity LED on the control panel. This LED will flash when the HDD is being accessed. ***Pins 19*** & ***20 of CN3*** connect the hard disk drive and the front panel HDD LED. ***Pins 19*** is -, and ***pin 20*** is assigned as +.

Reserved pins

Pins 7 and 9-16 of ***CN3*** are reserved pins.

4.5 Enhanced IDE Interface Connector

The **SBC81820** includes a PCI bus enhanced IDE controller that can support master/slave mode and post write transaction mechanisms with 64-byte buffer, and master data transaction. This feature, connected via connector **CN19** and **CN20**, allows the **SBC81820** to handle 4 IDE drives. Refer to Appendix B for the pinout assignments of **CN19** and **CN20**.

4.6 Display Interface

4.6.1 Flat Panel/CRT Interface Controller

The built-in LynxEM4+ is a high-performance flat panel/super VGA display controller with onboard 4M bytes VGA RAM. It can also support CRT at a maximum resolution of up to 1280x1024 with 64K colors. The LynxEM4+ supports color dual scan DSTN and TFT panel interface. For color TFT panel, LynxEM4+ can support single pixel per clock of 9-bit, 12-bit, 18-bit, 24-bit, or double-pixel per clock of 24-bit, 36-bit, 48-bit interface up to 1280x1024 resolution. LynxEM4+ can support two separate TFT LCDs.

4.6.2 Features

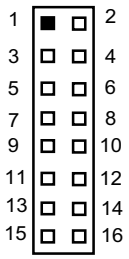
- Fully compatible with IBM™ VGA
- Flat panel and CRT monitor can be displayed simultaneously
- Onboard 4M bytes VGA RAM
- Supports panel resolution up to 1280x1024
- Supports non-interlaced CRT monitors with resolutions up to 1280x1024 64K colors
- SMARTMAP™ intelligent color to gray scale conversion enhances text legibility
- Integrated programmable linear address feature accelerates GUI performance
- Built-in 144 pins so-dimm connector for flat panel display.

4.6.3 VGA/Flat Panel Connectors

The **SBC81820 Series** has two connectors that support CRT VGA and flat panel displays, individually or simultaneously. **CN5** is a 16-pin pin header connector commonly used for the CRT VGA display, and **CN18** is a SO-DIMM connector for flat panel and front panel bezel connection. Configuration of the VGA interface is done via the software utility and no jumper setting is required.

CN5: CRT/VGA Connector Pin Assignment

Pin	Signal	Pin	Signal	Pin	Signal
1	Red	2	AGND	3	Green
4	N/A	5	Blue	6	AGND
7	N/A	8	DDC DAT	9	GND
10	AGND	11	GND	12	Horizontal Sync
13	AGND	14	Vertical Sync	15	DDC CLK
16	No connector				



CN18: SODIMM Connector for Flat Panel

Pin	Description	Pin	Description	Pin	Description
1	12V	2	12V	3	CMPS_IN
4	CMPS_OUT	5	LUMA_IN	6	LUMA_OUT
7	CRMA_IN	8	CRMA_OUT	9	VIDEO_GND
10	VIDEO_GND	11	BLUE_IN	12	BLUE_OUT
13	GREEN_IN	14	GREEN_OUT	15	RED_IN
16	RED_OUT	17	VCC3	18	VCC3
19	HSYNC_IN	20	VSYNC_IN	21	VP0
22	VP1	23	VP2	24	VP3
25	VP4	26	VP5	27	VP6
28	VP7	29	VP8	30	VP9
31	VP10	32	VP11	33	VCC3
34	VCC3	35	VP12	36	VP13
37	VP14	38	VP15	39	VRDY

Continued…

Pin	Description	Pin	Description	Pin	Description
40	VREF	41	HRET	42	VPCLK
43	VCLK	44	ENAVDD	45	VCON
46	LP	47	FLM	48	ENABKL
49	M	50	SHFCLK	51	VCC
52	VCC	53	P0	54	P1
55	P2	56	P3	57	P4
58	P5	59	P6	60	P7
61	P8	62	P9	63	P10
64	P11	65	P12	66	P13
67	P14	68	P15	69	VCC
70	VCC	71	P16	72	P17
73	P18	74	P19	75	P20
76	P21	77	P22	78	P23
79	P24	80	P25	81	P26
82	P27	83	P28	84	P29
85	P30	86	P31	87	VCC
88	VCC	89	P32	90	P33
91	P34	92	P35	93	P36
94	P37	95	P38	96	P39
97	P40	98	P41	99	P42
100	P43	101	P44	102	P45
103	P46	104	P47	105	VSS
106	VSS	107	DCLKB+(TXC+)	108	DCLKA+
109	DCLKB-(TXC-)	110	DCLKA-	111	DINB2+
112	DINA2+	113	DINB2-	114	DINA2-
115	VSS	116	VSS	117	DINB1+(TX2+)
118	DINA1+	119	DINB1-(TX2-)	120	DINA1-
121	DINB0+(TX1+)	122	DINA0+	123	DINB0-(TX1-)
124	DINA0-	125	VSS	126	VSS
127	IDE_LED-	128	IRTX	129	BUZZER_OUT
130	IRRX	131	5VSB	132	HIRRX
133	LANACT_LED	134	AUDIO GND	135	LAN100_LED-
136	VOLUP	137	ATX PWRBT-	138	VOLDW
139	H/W RESET-	140	MIC_IN	141	SMBDATA
142	SPKL_OUT/LOUT_L	143	SMBCLK	144	SPKR_OUT/LOUT_R

4.6.4 Flat Panel Connector Pin Description

Name	Description
P0~P47	Flat panel data output
ENABKL	Activity Indicator and Enable Backlight outputs
SHFCLK	Shift clock. Pixel clock for flat panel data
M	M signal for panel AC drive control
LP	Latch pulse. Flat panel equivalent of HSYNC
FLM	First line marker. Flat panel equivalent of VSYNC
+12VM	+12V power controlled by chipset
ENAVDD	Power sequencing controls for panel LCD Vcc

4.6.5 Flat Panel Interface Pins for Color DSTN and Color TFT LCD

	DSTN		TFT				
Pin	**16-bit**	**24-bit**	**9-bit**	**12-bit**	**18-bit**	**24-bit**	**12+12 bit**
LP	LP	LP	HSYNC	HSYNC	HSYNC	HSYNC	HSYNC
FLM	FP	FP	VSYNC	VSYNC	VSYNC	VSYNC	VSYNC
SHFCLK	XCK	XCK	CK	CK	CK	CK	CK
M			DE	DE	DE	DE	DE
ENAVDD	ENAVDD	ENAVDD	ENAVDD	ENAVDD	ENAVDD	ENAVDD	ENAVDD
ENABLK	ENABLK	ENABLK	ENABLK	ENABLK	ENABLK	ENABLK	ENABLK
P23		UD11				R7	RB3
P22		UD10				R6	RB2
P21		UD9			R5	R5	RB1
P20		UD8			R4	R4	RB0
P19	UD7	UD7		R3	R3	R3	RA3
P18	UD6	UD6	R2	R2	R2	R2	RA2
P17	UD5	UD5	R1	R1	R1	R1	RA1
P16	UD4	UD4	R0	R0	R0	R0	RA0
P15	UD3	UD3				G7	GB3
P14	UD2	UD2				G6	GB2
P13	UD1	UD1			G5	G5	GB1
P12	UD0	UD0			G4	G4	GB0
P11		LD11		G3	G3	G3	GA3
P10		LD10	G2	G2	G2	G2	GA2
P9		LD9	G1	G1	G1	G1	GA1
P8		LD8	G0	G0	G0	G0	GA0
P7	LD7	LD7				B7	BB3
P6	LD6	LD6				B6	BB2
P5	LD5	LD5			B5	B5	BB1
P4	LD4	LD4			B4	B4	BB0
P3	LD3	LD3		B3	B3	B3	BA3
P2	LD2	LD2	B2	B2	B2	B2	BA2
P1	LD1	LD1	B1	B1	B1	B1	BA1
P0	LD0	LD0	B0	B0	B0	B0	BA0

Pin Name	24+24 bit TFT	18+18 bit TFT	TFTs: FP1 + FP2
LP	HSYNC	HSYNC	FPI_HSYNC
FLM	VSYNC	VSYNC	FPI_VSYNC
SHFCLK	CK	CK	FPI_CK
M	DE	DE	FPI_DE
ENAVDD	ENAVDD	ENAVDD	ENAVDD
ENABLK	ENABLK	ENABLK	ENABLK
P47	RB7		FP2_R7
P46	RB6		FP2_R6
P45	RA7		FP2_R5
P44	RA6		FP2_R4
P43	GB7		FP2_R3
P42	GB6		FP2_R2
P41	GA7		FP2_R1
P40	GA6		FP2_R0
P39	BB7		FP2_G7
P38	BB6		FP2_G6
P37	BA7		FP2_G5
P36	BA6		FP2_G4
P35	RB5	RB5	FP2_G3
P34	RB4	RB4	FP2_G2
P33	RA5	RA5	FP2_G1
P32	RA4	RA4	FP2_G0
P31	GB5	GB5	FP2_B7
P30	GB4	GB4	FP2_B6
P29	GA5	GA5	FP2_B5
P28	GA4	GA4	FP2_B4
P27	BB5	BB5	FP2_B3
P26	BB4	BB4	FP2_B2
P25	BA5	BA5	FP2_B1
P24	BA4	BA4	FP2_B0

Continued . . . . .

Pin Name	24+24 bit TFT	18+18 bit TFT	TFTs: FP1 + FP2
P23	RB3	RB3	FP2_VSYNC
P22	RB2	RB2	FP2_HSYNC
P21	RB1	RB1	FP1_R5
P20	RB0	RB0	FP1_R4
P19	RA3	RA3	FP1-R3
P18	RA2	RA2	FP1_R2
P17	RA1	RA1	FP1_R1
P16	RA0	RA0	FP1_R0
P15	GB3	GB3	FP2_DE
P14	GB2	GB2	FP2_CK
P13	GB1	GB1	FP1_G5
P12	GB0	GB0	FP1_G4
P11	GA3	GA3	FP1_G3
P10	GA2	GA2	FP1_G2
P9	GA1	GA1	FP1_G1
P8	GA0	GA0	FP1_G0
P7	BB3	BB3	
P6	BB2	BB2	
P5	BB1	BB1	FP1_B5
P4	BB0	BB0	FP1_B4
P3	BA3	BA3	FP1_B3
P2	BA2	BA2	FP1_B2
P1	BA1	BA1	FP1_B1
P0	BA0	BA0	FP1_B0

4.7 Floppy Disk Controller: CN22

The **SBC81820** provides a 34-pin header type connector, **CN22**, supporting up to two floppy drives. The floppy drives may be any one of the following types: 5.25" 360KB/1.2MB and 3.5" 720KB/1.44MB/2.88MB. The **CN22** pin assignment is listed in Appendix B.

4.8 Parallel Port Interface: CN1

The **SBC81820** onboard **CN1** is a multi-mode parallel port able to support:

- **Standard mode:** IBM PC/XT, PC/AT and PS/2™ compatible with bi-directional parallel port
- **Enhanced mode:** Enhance parallel port (EPP) compatible with EPP 1.7 and EPP 1.9 (IEEE 1284 compliant)
- **High speed mode:** Microsoft and Hewlett Packard extended capabilities port (ECP) IEEE 1284 compliant

The address select of the onboard parallel port in LPT1 (3BCH) or disabled is done by BIOS CMOS setup.

4.9 Serial Port Interface

The serial interface onboard **SBC81820** consists of COM1 port (**CN2**) supports RS-232 and COM2 (**CN6**) provide RS-232/422/485 connectivity.

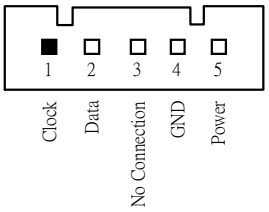
4.9.1 Serial Ports IRQ Selection

SBC81820 uses two 10-pin connectors for COM1 **(CN2)** and COM2 **(CN6)**. Interrupt Requests on COM1 and COM2 are selected via IRQ4 and IRQ3 respectively. Additionally, both ports can be enabled or disabled via BIOS setting. The RS-232 pin assignments for COM1 and COM2 along with the RS-485 pin assignments for COM2 are in Appendix B.

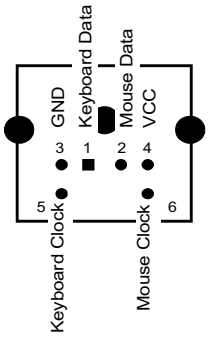
4.10 Keyboard and PS/2 Mouse Connectors

The **SBC81820** provides a keyboard **(CN15)** and PS/2 mouse **(CN14)** interface with a 5-pin connector. **CN16** is a DIN connector for PS/2 keyboard connection.

CN15/14



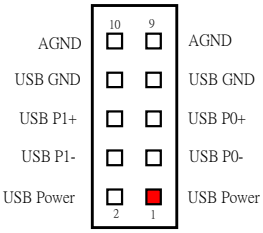
CN16



4.11 USB Connector

The Universal Serial Bus (USB) connector on the **SBC81820** is for installation of peripherals supporting the USB interface. **CN4** is the 10-pin USB connector on the **SBC81820**.

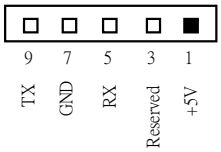
CN4



4.12 IrDA Connector

CN25 is a 10-pin IrDA connector for wireless communication.

CN25

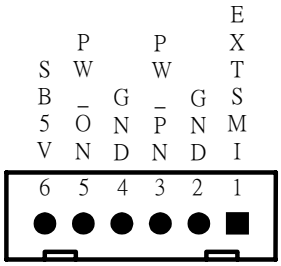


4.13 ATX SB5V Power Connector Connector

The interface enables and supports reliable power anagement through improved hardware and operating system coordination. The specification enables new power management technology to evolve independently in operating systems and hardware while ensuring that they continue to work together.

CN11 on the **SBC81820** is a 6-pin header connector that provides **ATX SB5V Power**.

CN11



4.14 ATX12V CPU Power Connector: CN7

This connector connected to an ATX12V power supply and used for CPU Core Voltage.

Important Note: Make sure your ATX12V power supply can provide 8A on the +12V lead and at least 1A on the +5V standby lead (+5VSB). The minimum recommended wattage is 230W or 300W for a fully configured system. The system may become unstable and may experience difficulty powering up if the power supply is inadequate.

4.15 Mini-PCI Connector: CN12

This mini-PCI connector is designed for "on-board" expansion. You don't need back plane to have another SCSI card, gigabit LAN card or IDE control card.

We prepare these types of mini-PCI card and them can be sold as accessories of SBC81820.

For the futher information, please refer the mini-PCI card's manual.

This page does not contain any information.

Chapter 5
Display Drivers

5.1 Introduction

The LynxEM+ combines Silicon Motion's unique multimedia features into a MCB solution. The LynxEM+ includes 4MB of video memory within a single footprint. This powerful single footprint solution, when combined with SMI's Virtual Refresh™ architecture provides a complete video sub-system which consumes very little power.

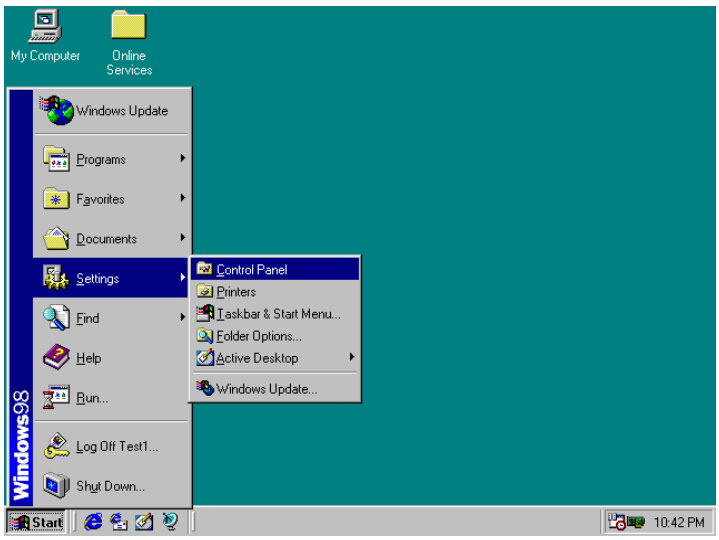
5.2 Driver Disks' Contents

The driver diskettes that come with the **SBC81820 Series** package contains the following installation programs:

- Win98 driver
- NT4.0 diver
- Win2000 driver
- SMI Control Program

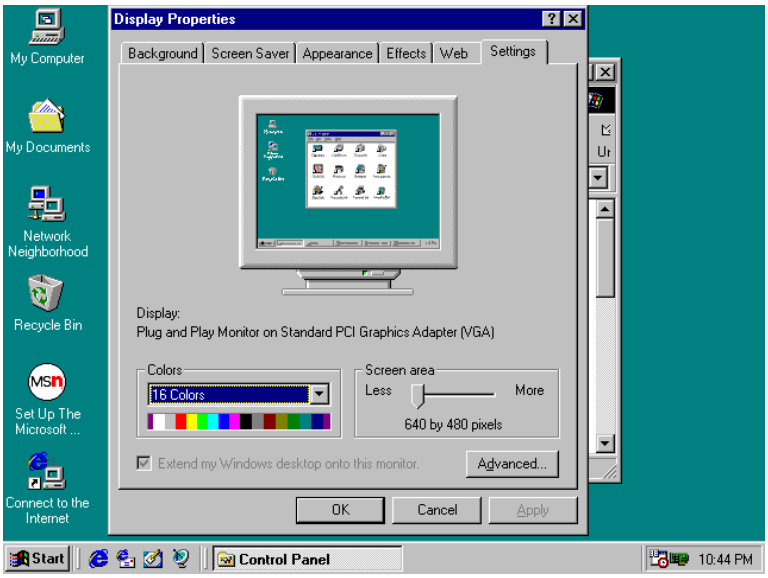
5.3 Windows 98 VGA Driver Installation

Run Windows 98 Control Panel.

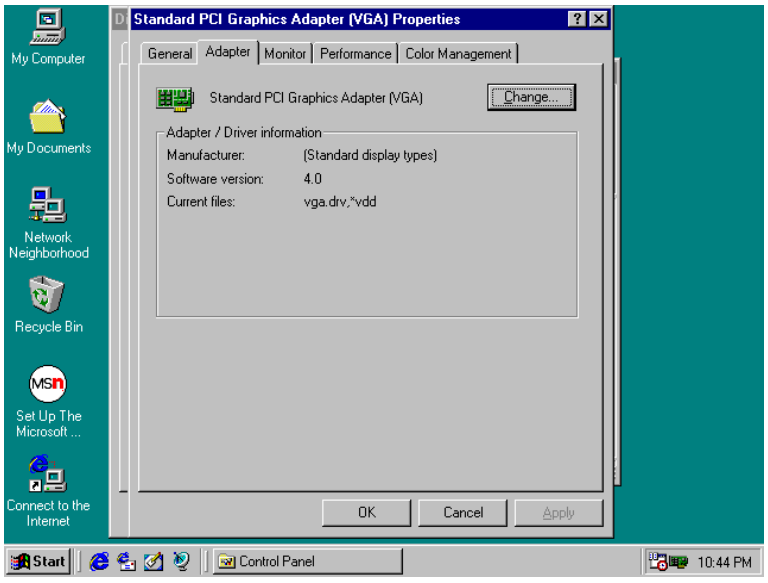


Choose the Display option.

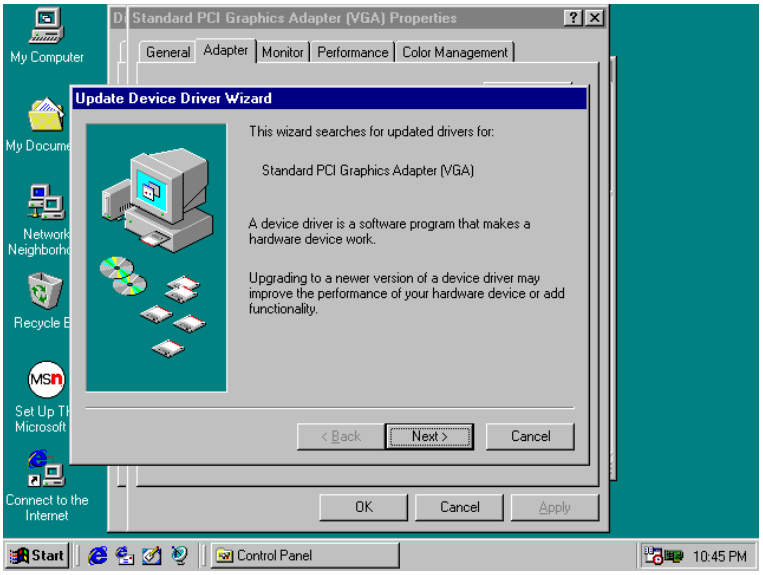
In the Display Settings dialog box, click on Advanced.



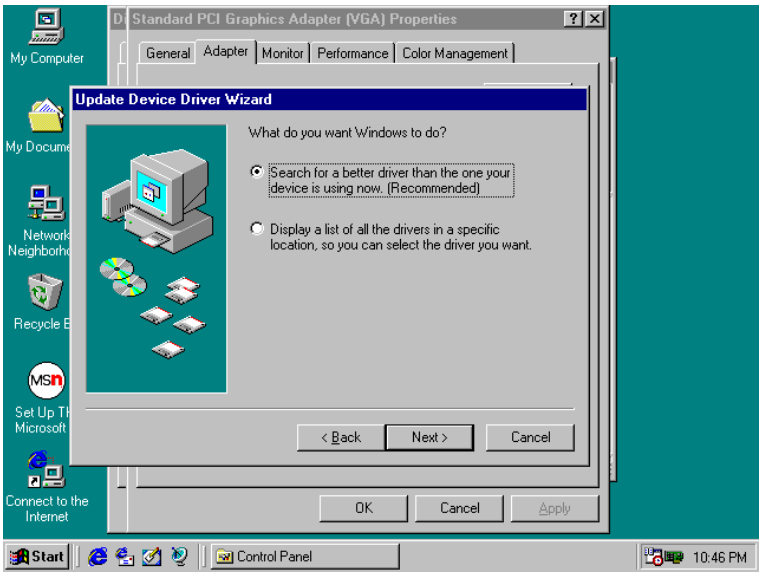
In the Adapter dialog box , click on Change.



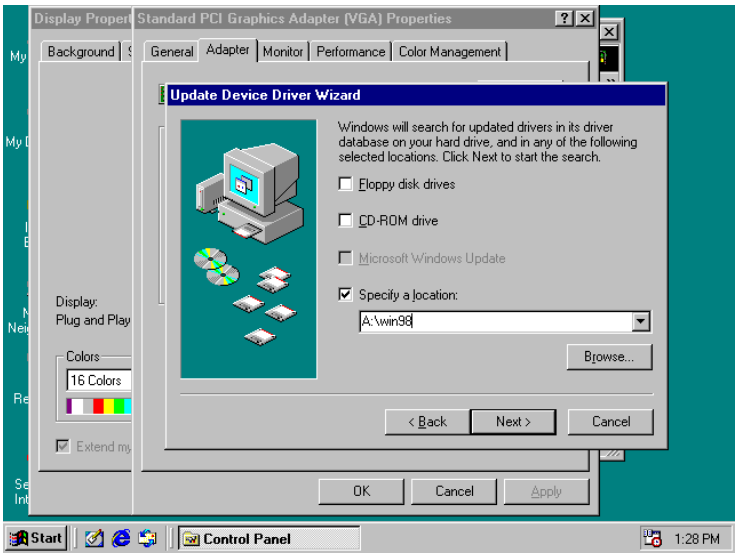
Click on Next



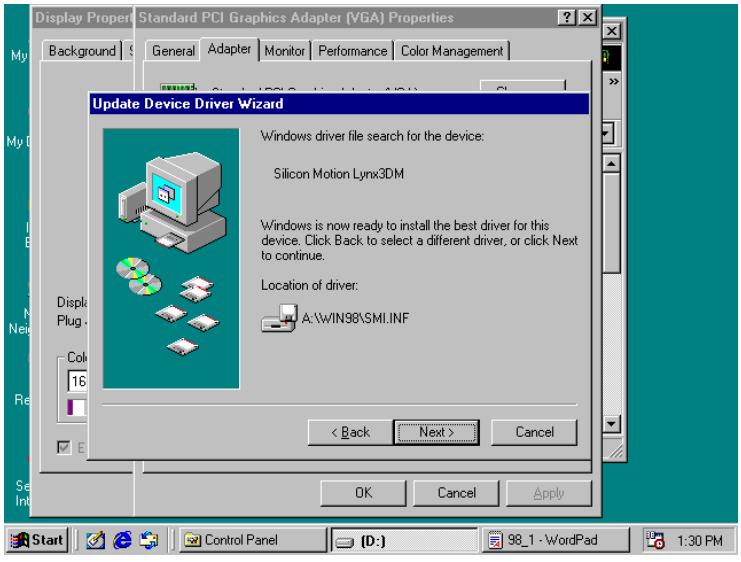
Click on Next



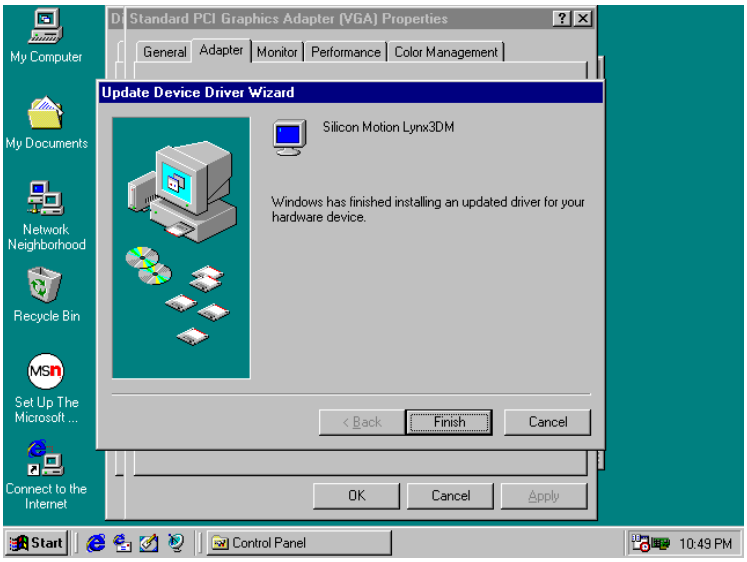
Place the VGA Driver Diskette in drive A. Click on Next to continue.



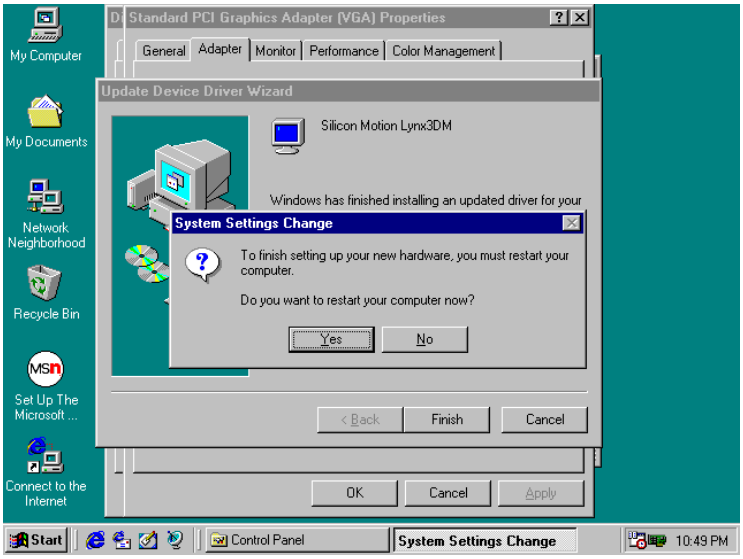
Click on Next



Click on Finish

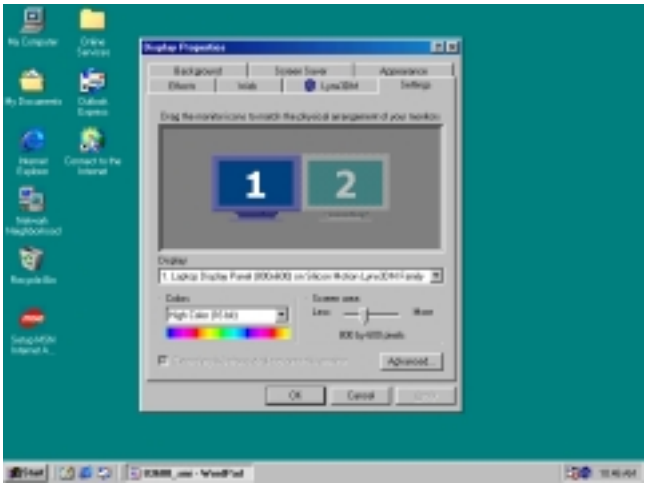


Once the installation is complete, the system must be shut down and restarted.

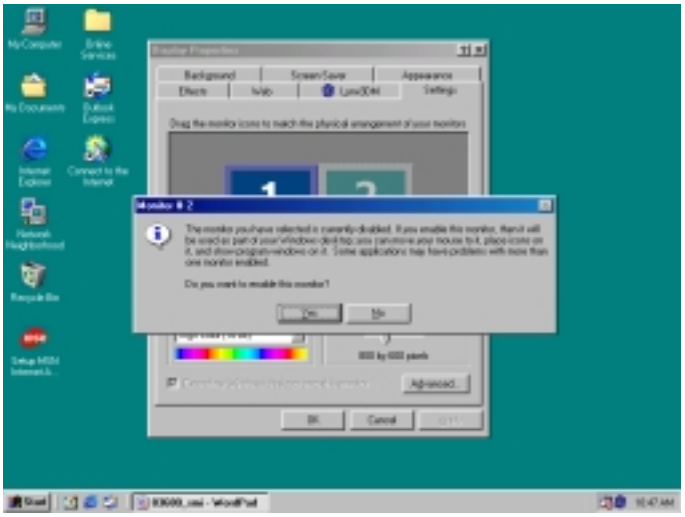


When Driver is completely installed, proceed to Display Settings and you will see 2 displays.

NOTE: *Make sure the resolution matches the installed LCD.*



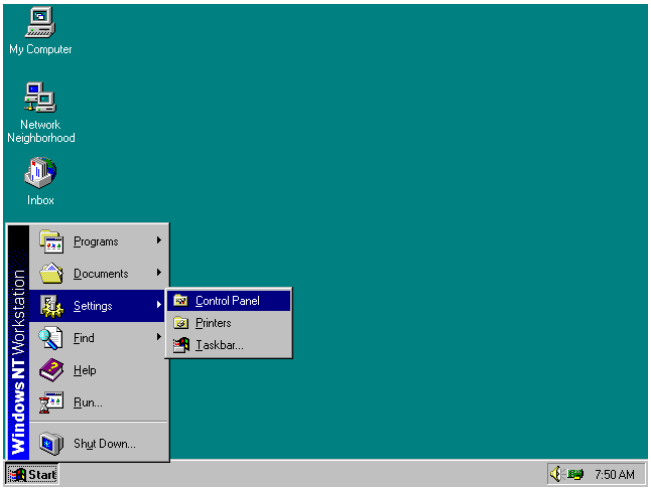
Selecting 2 from the above screen will prompt you whether or not you want to enable the 2nd display. Click on Yes to enable the 2nd display.



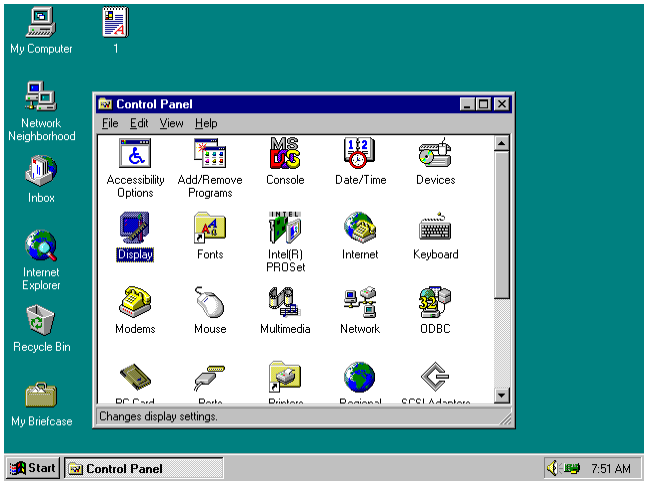
You may now configure the settings of display 2.

5.4 NT 4.0 VGA Driver Installation

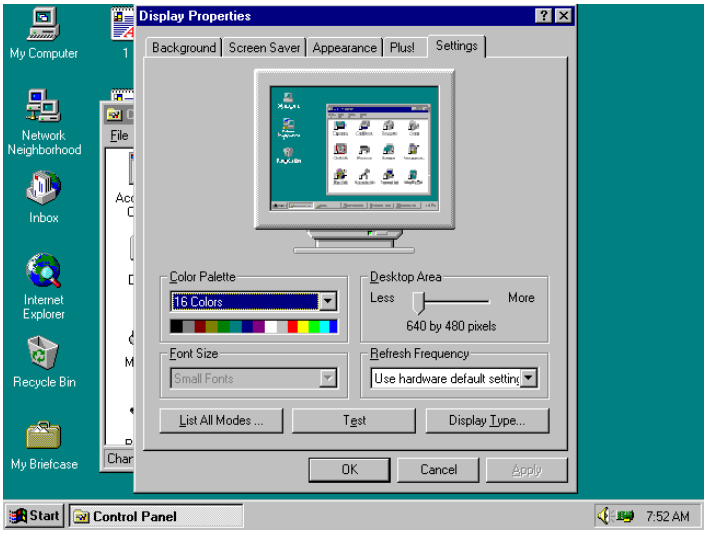
Install Service Pack then run Windows NT Control Panel.



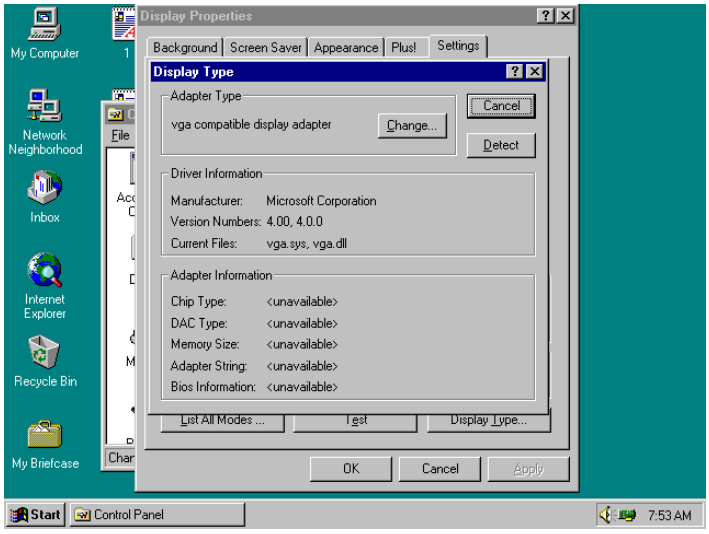
Choose the Display option.



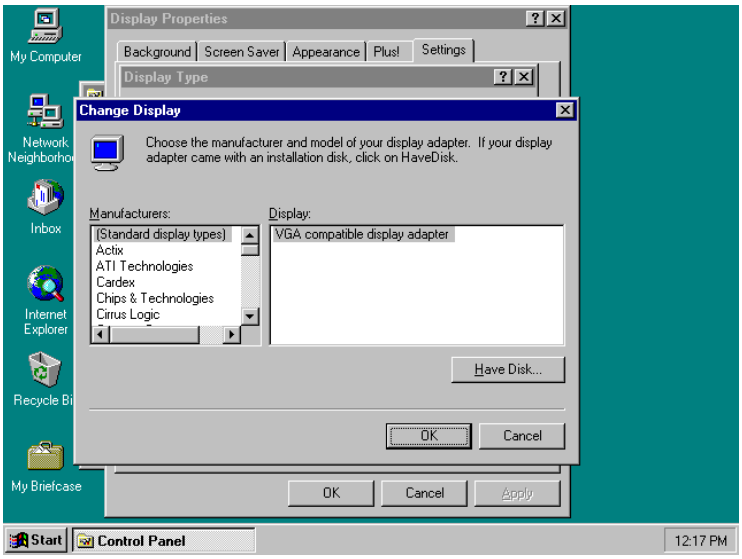
In the Display Settings dialog box, click on Display Type.



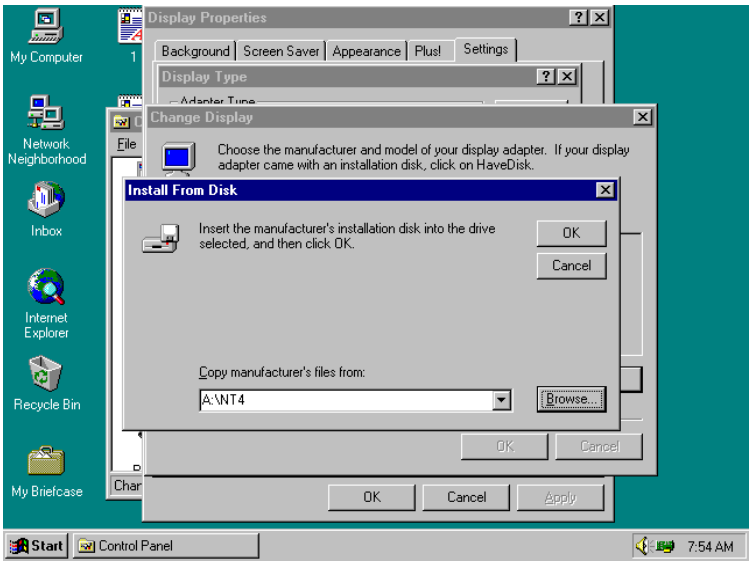
In the Display Type dialog box, click on Change.



Click on Have Disk

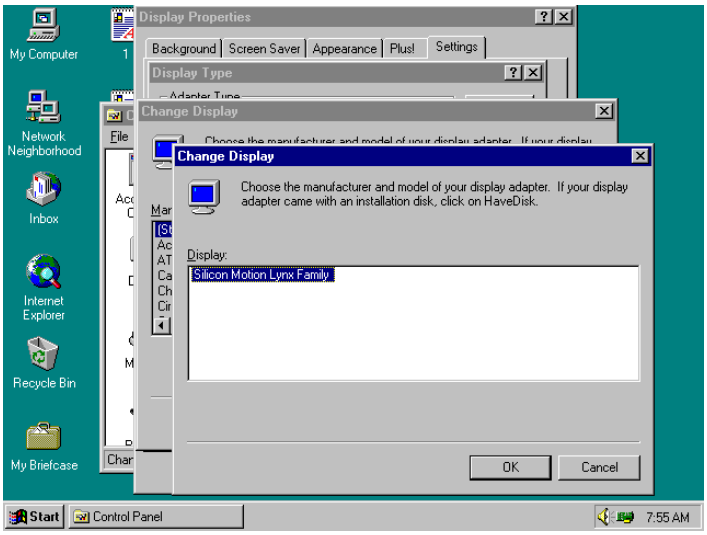


Place the VGA Driver Diskette in drive A. Click on OK will be continue.

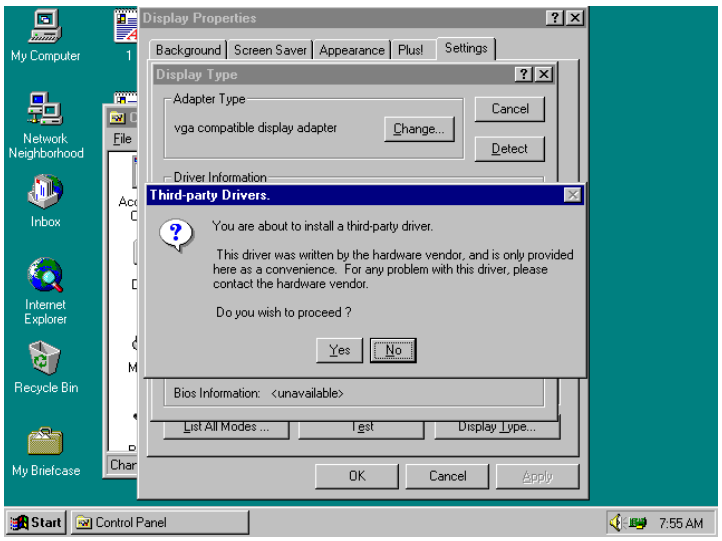


Silicon Motion Lynx Family will appear highlighted in the Models list box.

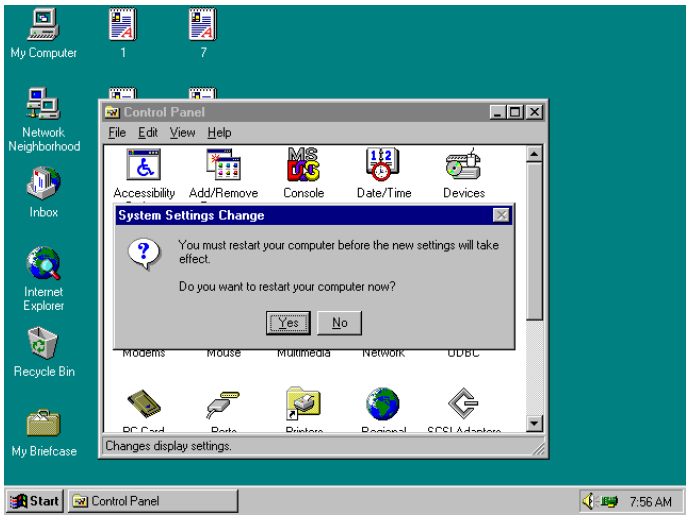
Click on OK to install the selected driver.



Click on Yes.

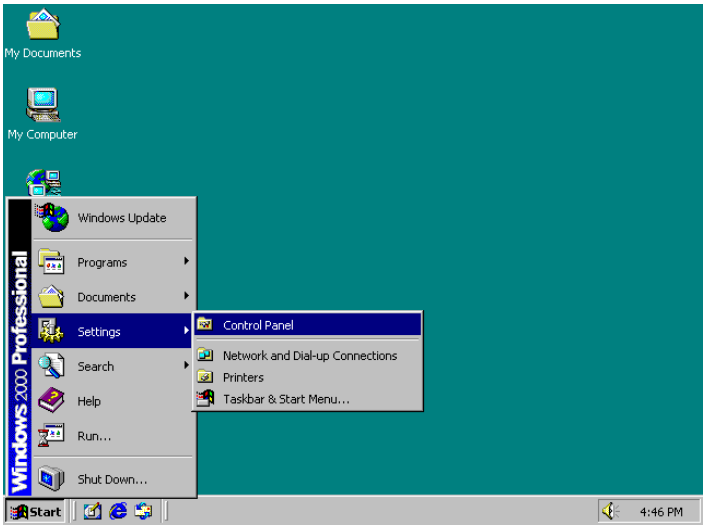


Once the installation is complete, the system must be shut down and restarted.



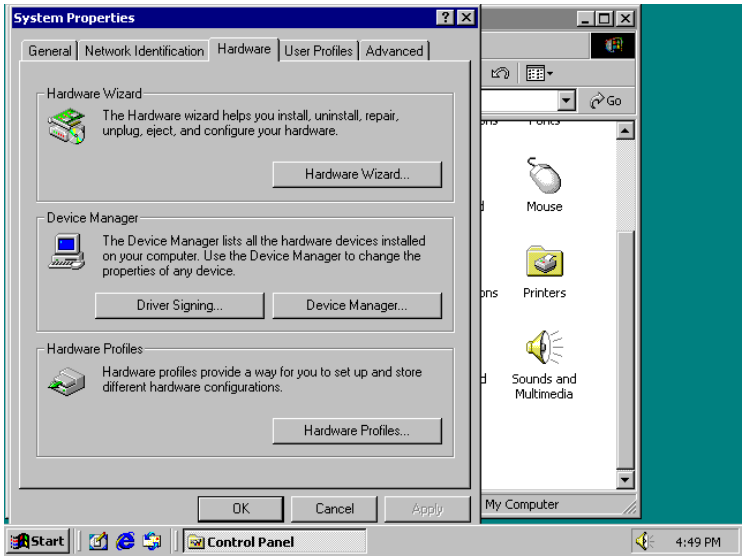
5.5 Windows 2000 VGA Driver Installation

Run Windows 2000 Control Panel.

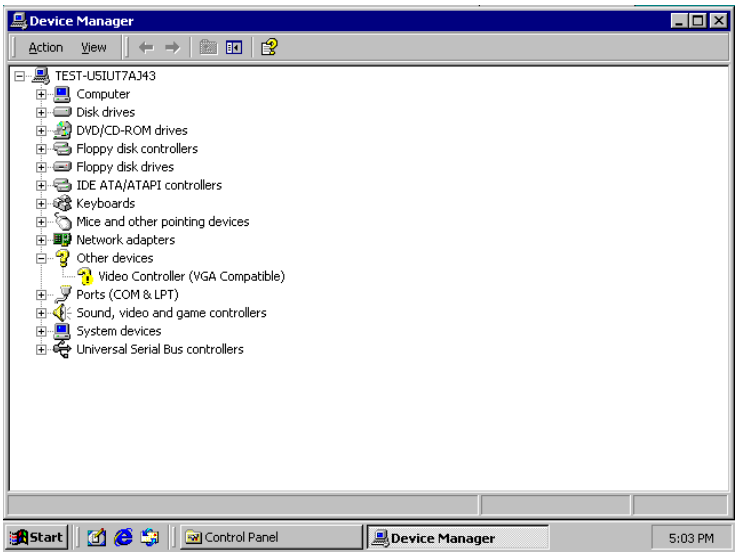


Choose the System option.

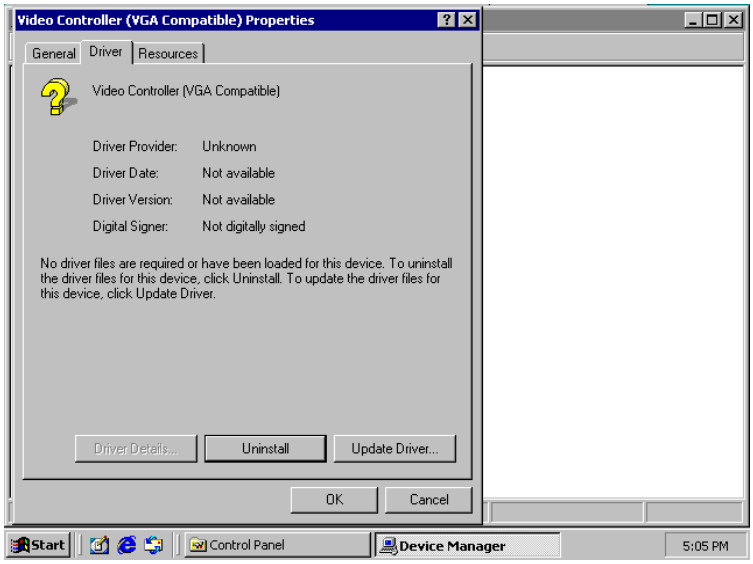
In the System Hardware dialog box, click on Device Manager.



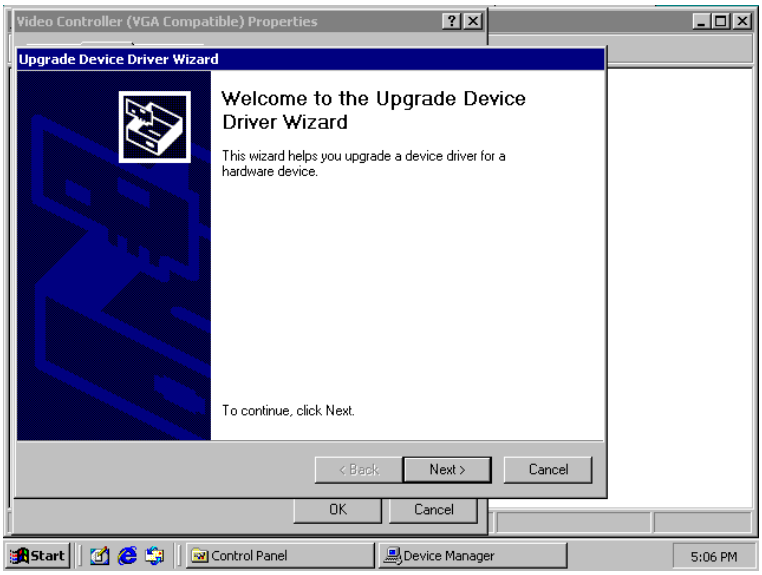
In the Device Manager dialog box, double click on Video Controller.



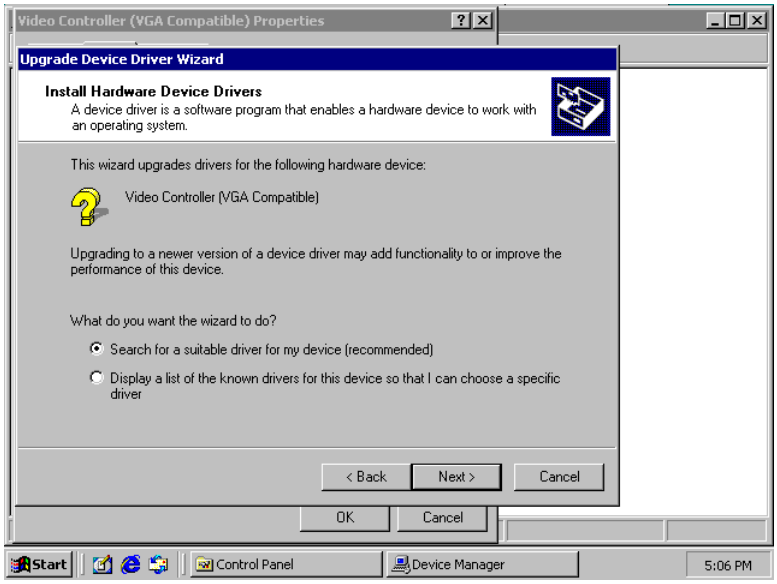
In the Driver dialog box, click on Update Driver.



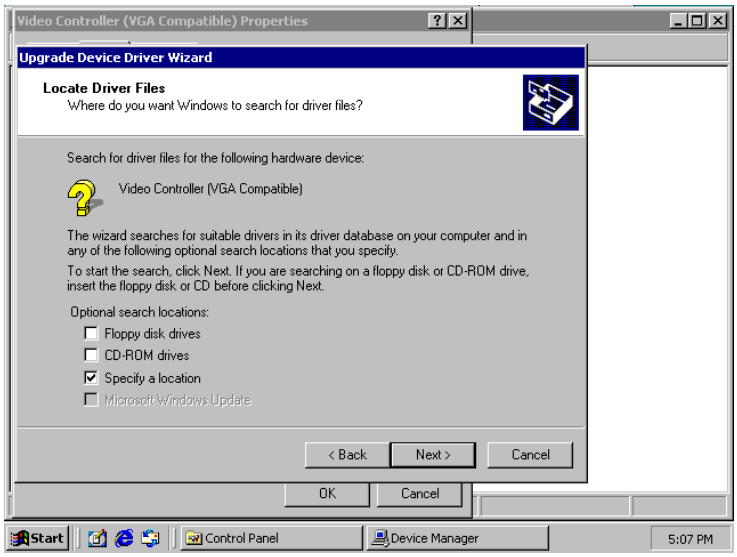
Click on Next.



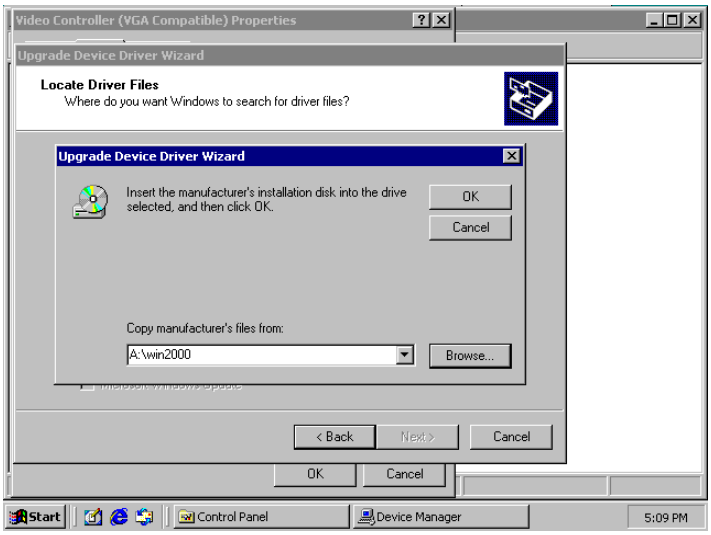
Click on Next.


Video Controller (VGA Compatible) Properties
Upgrade Device Driver Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard upgrades drivers for the following hardware device:
Video Controller (VGA Compatible)
Upgrading to a newer version of a device driver may add functionality to or improve the performance of this device.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel
OK
Cancel
Start
Control Panel
Device Manager
5:06 PM

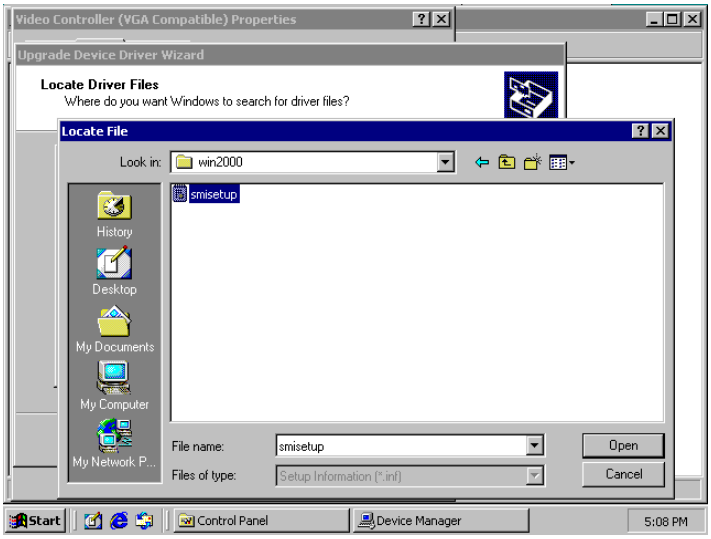
Click on Next.


Video Controller (VGA Compatible) Properties
Upgrade Device Driver Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
Video Controller (VGA Compatible)
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel
OK
Cancel
Start
Control Panel
Device Manager
5:07 PM

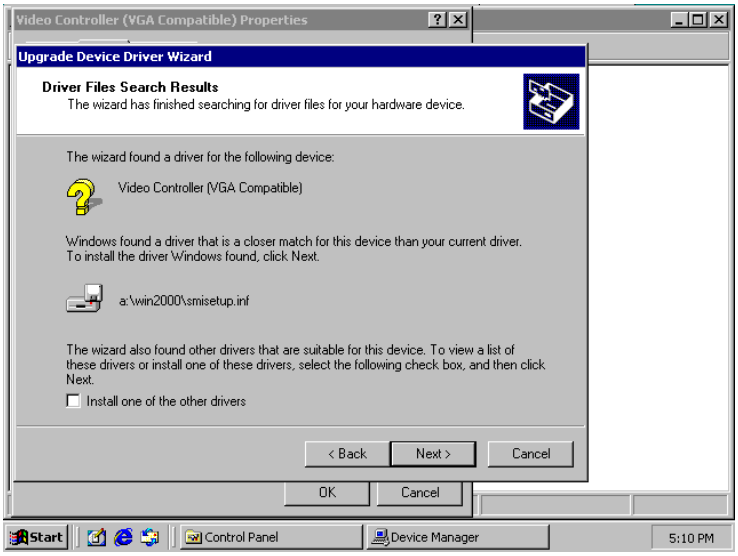
Place the VGA Driver Diskette in drive A. Click on OK to continue.



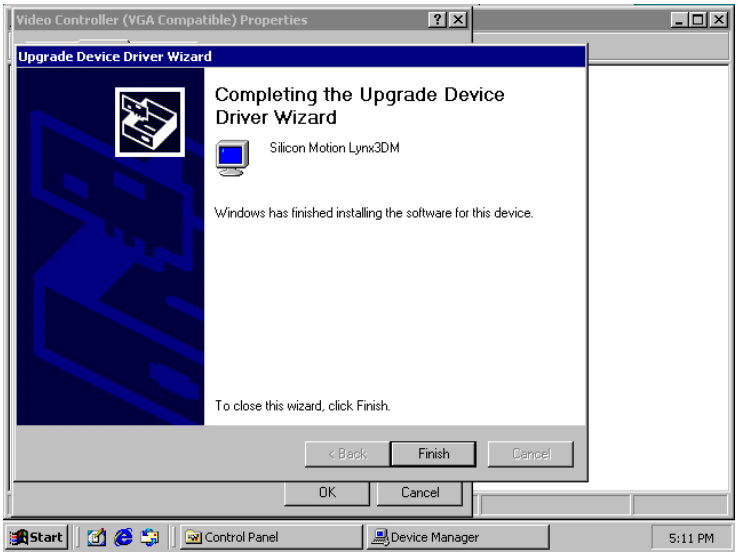
Smisetup will appear highlighted in the Models list box. Click on Open to install the selected driver.



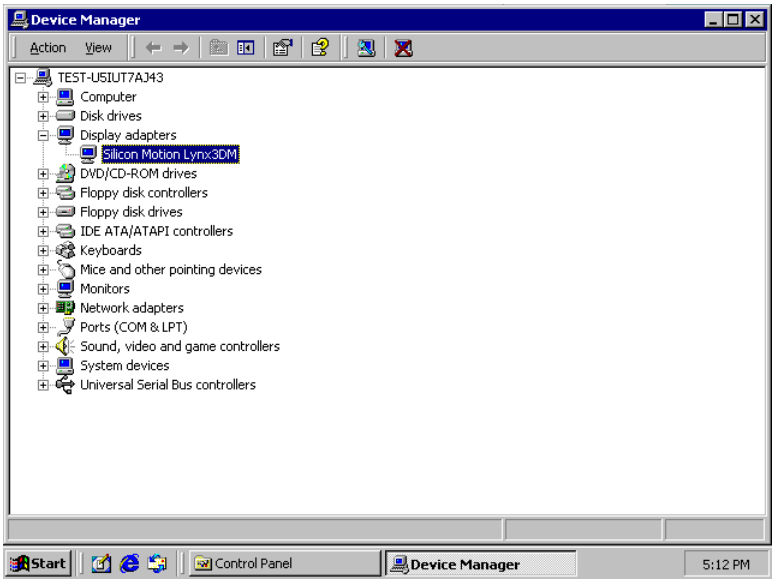
Click on Next.


Video Controller (VGA Compatible) Properties
Upgrade Device Driver Wizard
Driver Files Search Results
The wizard has finished searching for driver files for your hardware device.
The wizard found a driver for the following device:
Video Controller (VGA Compatible)
Windows found a driver that is a closer match for this device than your current driver.
To install the driver Windows found, click Next.
a:\win2000\smisetup.inf
The wizard also found other drivers that are suitable for this device. To view a list of these drivers or install one of these drivers, select the following check box, and then click Next.
Install one of the other drivers
< Back
Next >
Cancel
OK
Cancel
Start
Control Panel
Device Manager
5:10 PM

Click on Finish.



Installation completed



5.6 SMI Control Panel Program Setup

To install the control panel for the first time, insert floppy and run the SETUP.EXE.

To upgrade the control panel to a newer version, please close the existing SMI control panel before proceeding. Error will occur during the installation if fail to do so. For best result, remove the old version of the control panel first before installing the new control panel.

The Silicon Motion Control Panel is integrated into the Windows Display Properties Control Panel. The Silicon Motion Control Panel program supports the following special modes:

- **1. DualApp - Display independent applications (CRT or LCD) on two different displays.**
- **2. Rotation Mode - Display the screen content with 90, 180 or 270 degrees rotation.**
- **3. Stretch Mode – For LCD display:**
  - 1) Stretch a lower resolution graphics mode (e.g. 800x600 on a 1024x768 panel) to fill the display.
  - 2) Display lower resolution screen content (e.g. DOS game) in full screen mode. See Stretch Mode.

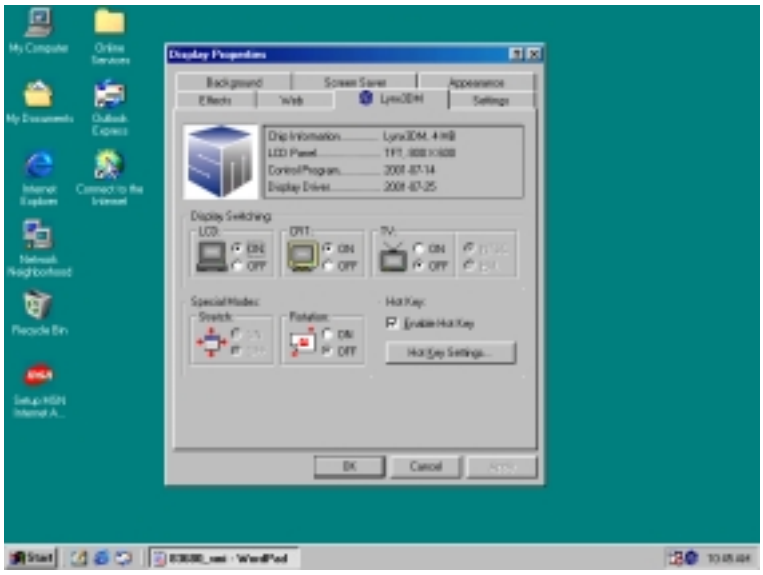
NOTES:

1) For operating systems which natively support multi-display capability (e.g. Windows 98), DualApp and DualView capabilities will be handled via the native support mechanism, instead of the Control Panel program.

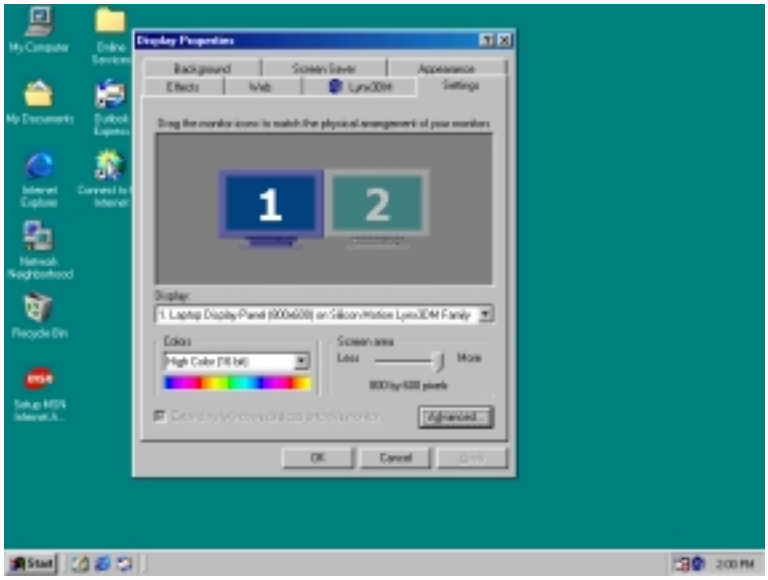
2) When in any of the special modes: Display switching is disabled. Turn off the special mode first before display switching.

3) Do not disable the Control Panel program while in any of the special modes. Closing the Control Panel program will turn off special modes automatically.

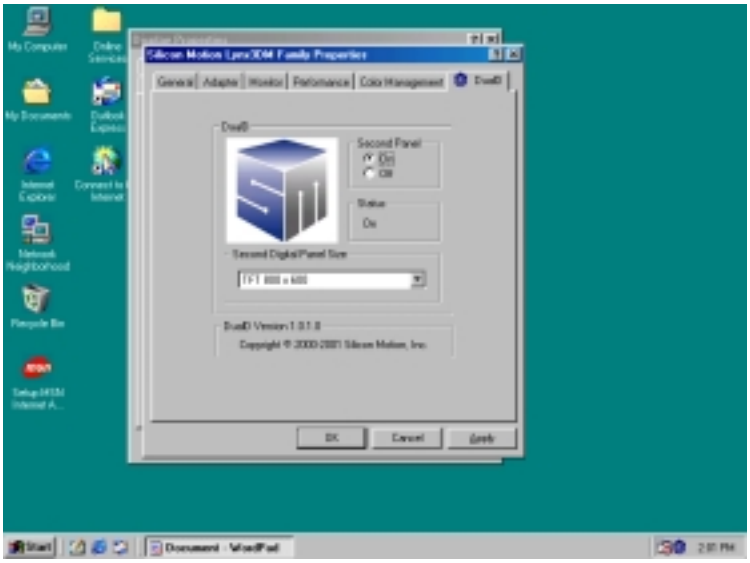
Execute Control Panel Program under Windows 98



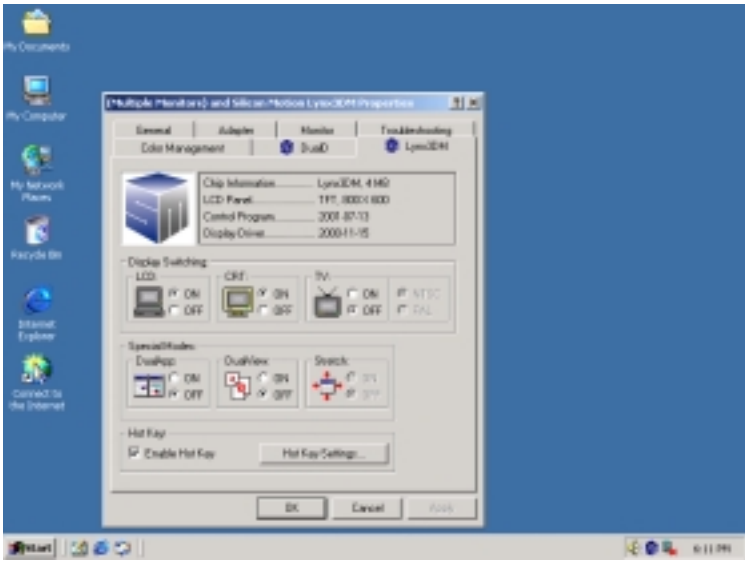
In the Settings dialog box, click on Advanced.



In the DuallD dialog box, setting Second Panel.



Execute Control Panel Program under Windows 2000.



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Chapter 6
Ethernet

6.1 Introduction

The **SBC81820** is equipped with the high performance Plug and Play Ethernet interface which is fully compliant with the IEEE 802.3 standard, and consisting of the RJ-45 connector **(CN7, CN8 and CN9)**.

6.2 Features

- 10Mb/s and 100Mb/s operations
- Supports 10Mb/s and 100Mb/s N-Way auto negotiation
- Full duplex capability
- Full compliance with PCI Revision 2.1
- PCI Bus Master data transfers

6.3 Drivers Supported

Bundled with popular software drivers, the **SBC81820** Ethernet interface allows great flexibility to work with all major networking operating systems including Novell NetWare v2.x, v3.x, v4.x, Microsoft LAN Manager, Win3.1, Win NT, IBM LAN Server, SCO UNIX or other ODI, NDIS and Packet drive compliant operating systems.

NOTE: *Before you begin the driver software installation, please see the detailed installation procedure from the Product Information CD-ROM and be sure to make installation and backup copies of the driver files.*

This page does not contain any information.

Chapter 7
Award BIOS Utility

Chapter 8 describes the different settings available in the Award BIOS that comes with the **SBC81820** CPU card. Also contained here are instructions on how to set up the BIOS configuration.

7.1 BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel Celeron processors in a standard IBM-AT compatible I/O system. The BIOS provides critical low-level support for standard devices such as disk drives, serial and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

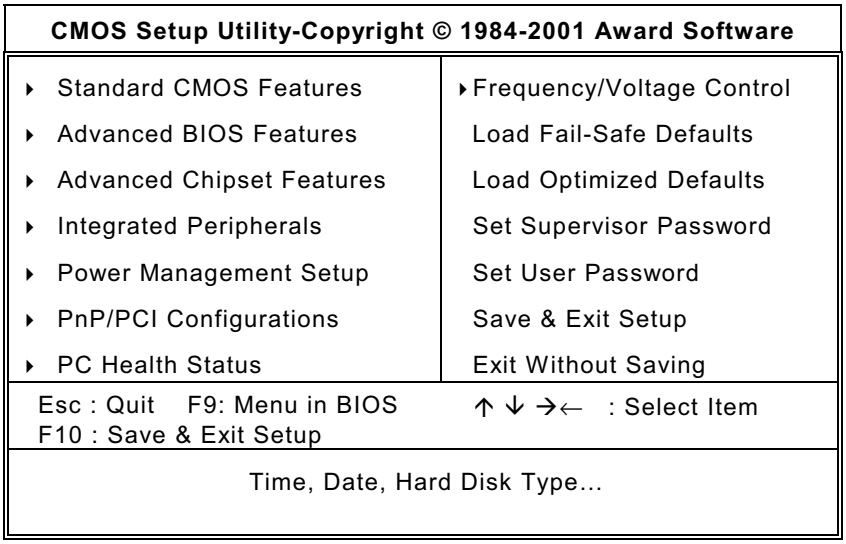
7.2 BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn ON the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system OFF and back ON again. The following message will appear on the screen:

Press <DEL> to Enter Setup

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.



The section below the setup items of the Main Menu displays the control keys for this menu. Another section located at the bottom of the Main Menu, just below the control keys section, displays information on the currently highlighted item in the list.

NOTE: *If you find that your computer cannot boot after making and saving system changes with Setup, the Award BIOS, via its built-in override feature, resets your system to the CMOS default settings.*

We strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability.

7.3 Standard CMOS Setup

"Standard CMOS Setup" allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the motherboard is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

CMOS Setup Utility-Copyright © 1984-2001 Award Software
Standard CMOS Features

		Item Help
Date (mm:dd:yy)	Thu, Jan 10 2002	
Time (hh:mm:ss)	2 : 31 : 24	
		Menu Level ▶
▶ IDE Primary Master		
▶ IDE Primary Slave		Change the Day, month, Year and Century
▶ IDE Secondary Master		
▶ IDE Secondary Slave		
Drive A	1.44M, 3.5 in.	
Drive B	None	
LCD Type	640x480 TFT	
TFT Format	9 Bits	
DSTN Format	16 Bits	
Expansion (Full Screen)	Enabled	
Disp Set(s) at POST/BOOT	LCD Only	
Halt On	All, But Keyboard	

↑↓→← : Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following pages describe each item of this menu.

- **Date**
  The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

day	The day of week, from Sun to Sat, determined by the BIOS, is read only
date	The date, from 1 to 31 (or the maximum allowed in the month), can key in the numerical / function key
month	The month, Jan through Dec.
year	The year, depends on the year of BIOS

- **Time**
  The time format is <hour> <minute> <second> accepting either function key or numerical key. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

- **Primary Master / Primary Slave / Secondary Master / Secondary Slave**
  The categories identify the types of one channel that have been installed in the computer. There are 45 predefined types and 2 user definable types are for Enhanced IDE BIOS. Type 1 to Type 45 are predefined. Type User is user-definable.
  Press <PgUp>/<+> or <PgDn>/<–> to select a numbered hard disk type or type the number and press <Enter>. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information within this category. If your hard disk drive type does not match or is not listed, you can use Type User to define your own drive type manually.
  If you select Type User, related information is asked to be entered to the following items. Enter the information directly from the keyboard and press <Enter>. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.
  If the controller of HDD interface is ESDI, select “Type 1”.
  If the controller of HDD interface is SCSI, select “None”.
  If the controller of HDD interface is CD-ROM, select “None”.

CYLS.	number of cylinders	LANDZONE	landing zone
HEADS	number of heads	SECTORS	number of sectors
PRECOMP	write precom	MODE	HDD access mode

  If there is no hard disk drive installed, select NONE and press <Enter>.

- **Drive A type / Drive B type**
  The category identifies the types of floppy disk drive A or drive B installed in the computer.

None	No floppy drive installed
360K, 5.25 in	5.25 inch PC-type standard drive; 360Kb capacity
1.2M, 5.25 in	5.25 inch AT-type high-density drive; 1.2MB capacity
720K, 3.5 in	3.5 inch double-sided drive; 720Kb capacity
1.44M, 3.5 in	3.5 inch double-sided drive; 1.44MB capacity
2.88M, 3.5 in	3.5 inch double-sided drive; 2.88MB capacity

- **Halt On**
  This field determines whether the system will halt if an error is detected during power up.

No errors	The system boot will halt on any error detected. (default)
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error; it will stop for all other errors.

7.4 Advanced BIOS Features

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

CMOS Setup Utility-Copyright © 1984-2001 Award Software
Advanced BIOS Features

		Item Help
Virus Warning	Disabled	
CPU L1 & L2 Cache	Enabled	
Quick Power On Self Test	Enabled	Menu Level ▶
First Boot Device	Floppy	Allows you to
Second Boot Device	HDD-0	choose the VIRUS
Third Boot Device	LS120	warning feature
Boot Other Device	Enabled	for IDE Hard disk
Swap Floppy Drive	Disabled	boot sector
Boot Up Floppy Seek	Enabled	protection. If this
Boot Up NumLock Status	On	function is enable
Gate A20 Option	Fast	and someone
Typematic Rate Setting	Disabled	attempts to write
Typematic Rate (Chars/Sec)	6	data into this area,
Typematic Delay (Msec)	250	BIOS will show
Security Option	Setup	a warning
PS/2 Mouse Function Control	Enabled	message on
APIC Mode	Enabled	screen and alarm
MPS Version Control For OS	1.4	beep
OS Select For DRAM > 64MB	Non-OS2	
Report No FDD For WIN 98	No	
Video BIOS Shadow	Enabled	
Small Logo(EPA) Show	Disabled	

↑↓→← : Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **Virus Warning**
  This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program to locate and remove the problem.

  NOTE: *Many disk diagnostic programs, which attempt to access the boot sector table, can cause the virus warning. If you will run such a program, disable the Virus Warning feature.*

- **CPU L1 & L2 Cache**
  These two categories speed up memory access. However, it depends on CPU/chipset design.

Enabled	Enable cache
Disabled	Disable cache

- **Quick Power On Self Test**
  This option speeds up Power On Self Test (POST) after you turn on the system power. If set as Enabled, BIOS will shorten or skip some check items during POST. The default setting is *"Enabled"*.

Enabled	Enable Quick POST
Disabled	Normal POST

- **First / Second / Third Boot Device**
  These items allow the selection of the 1st, 2nd, and 3rd devices that the system will search for during its boot-up sequence. The wide range of selection includes Floppy, LS120, ZIP100, HDD0~3, SCSI, and CDROM.

- **Boot Other Device**
  This item allows the user to enable/disable the boot device not listed on the First/Second/Third boot devices option above. The default setting is ***Enabled***.

- **Swap Floppy Drive**
  This allows you to determine whether to enable Swap Floppy Drive or not. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to ***Disabled.***

- **Boot Up Floppy Seek**
  During POST, BIOS will determine the floppy disk drive type, 40 or 80 tracks, installed in the system. 360Kb type is 40 tracks while 720Kb, 1.2MB and 1.44MB are all 80 tracks. The default value is *"Enabled"*.

Enabled	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Note that BIOS can not tell from 720K, 1.2M or 1.44M drive type as they are all 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. There will be no warning message displayed if the drive installed is 360K.

- **Boot Up NumLock Status**
  This option enables and disables the numberlock function of the keypad. The default value is *"On"*.

On	Keypad functions confine with numbers
Off	Keypad functions convert to special functions (i.e., left/right arrow keys)

- **Gate A20 Option**
  The default value is *"Fast"*.

Normal	The A20 signal is controlled by keyboard controller or chipset hardware.
Fast	Default: Fast. The A20 signal is controlled by Port 92 or chipset specific method.

- **Typematic Rate Setting**
  This determines the typematic rate of the keyboard. The default value is *"Disabled"*.

Enabled	Enable typematic rate and typematic delay programming
Disabled	Disable typematic rate and typematic delay programming. The system BIOS will use default value of these 2 items and the default is controlled by keyboard.

- **Typematic Rate (Chars/Sec)**
  This option refers to the number of characters the keyboard can type per second. The default value is *"6"*.

6	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second
24	24 characters per second
30	30 characters per second

- **Typematic Delay (Msec)**
  This option sets the display time interval from the first to the second character when holding a key. The default value is *"250"*.

250	250 msec
500	500 msec
750	750 msec
1000	1000 msec

- **Security Option**
  This item allows you to limit access to the system and Setup, or just to Setup. The default value is *"Setup"*.

System	The system will not boot and access to Setup will be denied if the incorrect password is entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

NOTE: *To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything, just press <Enter> and it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.*

- **PS/2 mouse function control**
  This item allows you to determine to enable the hardware PS/2 mouse function or not. The available choices are *Enabled* and *Disabled*.

- **APIC Mode**
  This item allows you to enable/disable the APIC 8259 mode.
  The choice: Enabled/Disabled.

- **MPS Version Control For OS**
  This item allows you to select the version of MPS table for NT 4.0.
  The choice: 1.1, 1.4

- **OS Select for DRAM > 64MB**
  This segment is specifically created for OS/2 when DRAM is larger than 64MB. If your operating system is OS/2 and DRAM used is larger the 64MB, you have to select "OS 2", otherwise (under non-OS2), default is NON-OS2. The default value is *"Non-OS2"*.

- **Report No FDD For WIN 98**
  This option allows Windows 98 to share IRQ6 (assigned to a floppy disk drive) with other peripherals in case the drive is not existing. The default setting is *"No"*.

- **Video BIOS Shadow**
  Video shadowing increases the video speed by copying the video BIOS into RAM. However, it is still optional depending on the chipset design. The default value of this option is *"Enabled"*.

Enabled	Video BIOS shadowing is enabled
Disabled	Video BIOS shadowing is disabled

7.5 Advanced Chipset Features

Since the features in this section are related to the chipset on the CPU board and are completely optimized, you are not recommended to change the default settings in this setup table unless you are well oriented with the chipset features.

CMOS Setup Utility-Copyright © 1984-2001 Award Software
Advanced Chipset Features

DRAM Timing Selectable	By SPD	Item Help
CAS Latency Time	1.5	
Active to Precharge Delay	7	Menu Level ►
DRAM RAS# to CAS# Delay	3	
DRAM RAS# Precharge	3	
DRAM Data Integrity Mode	Non-ECC	
Memory Frequency For	Auto	
Dram Read Thermal Mgmt	Disabled	
System BIOS Cacheable	Enabled	
Video BIOS Cacheable	Disabled	
Video RAM Cacheable	Disabled	
Memory Hole At 15M-16M	Disabled	
Delayed Transaction	Enabled	
Delay Prior to Thermal	16 Min	

↑↓→← : Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **CAS Latency Time**
  When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing.
  The Choice: 1.5, 2, 2.5, 3.
- **Active to Precharge Delay**
  This item controls the number of DRAM clocks for TRAS.
  The Choice: 7, 6, 5.
- **DRAM RAS# to CAS# Delay**
  This field let's you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.

The Choice: 3, 2.

- **DRAM RAS# Precharge**
  If an insufficient number of cycles is allowed for the RAS to accumulate its charge before DRAM refresh, the refresh may be incomplete and the DRAM may fail to retain data. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.
  The Choice: 2, 3.

- **DRAM Data Integrity Mode**
  This item allows you to enable/disable the DRAM ECC function which will recover the single bit errors when user plug-in ECC DRAM.
  The choice: Non-ECC, ECC.

- **System BIOS Cacheable**
  Selecting *Enabled* allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.
  The choice: Enabled, Disabled.

- **Video BIOS Cacheable**
  Select Enabled allows caching of the video BIOS, resulting in better system performance. However, if any program writes to this memory area, a system error may result.
  The Choice: Enabled, Disabled.

- **Video RAM Cacheable**
  Select Enabled allows caching of the A/B segment, resulting in better system performance.
  The Choice: Enabled, Disabled.

- **Memory Hole at 15MB - 16MB**
  In order to improve performance, certain space in memory can be reserved for ISA cards. This field allows you to reserve 15MB to 16MB memory address space to ISA expansion cards. This makes memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB. By default, this field is set to ***Disabled***.

- **Delayed Transaction**
  The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select *Enabled* to support compliance with PCI specification version 2.1. The default setting is ***Disabled***.

- **Delay Prior to Thermal**
  This item allows you to select the delayed time to enable P4 CPU

Thermal function. When enter into NT 4.0, this function must be active to prevent from the system hanged.
The Choice: 4 Min, 8 Min, 16 Min, 32Min.

7.6 Integrated Peripherals

This option sets your hard disk configuration, mode and port.

CMOS Setup Utility-Copyright © 1984-2001 Award Software Integrated Peripherals		
On-Chip Primary PCI IDE	Enabled	Item Help
IDE Primary Master PIO	Auto	
IDE Primary Slave PIO	Auto	Menu Level ►
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
On-Chip Secondary PCI IDE	Enabled	
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Secondary Master UDMA	Auto	
IDE Secondary Slave UDMA	Auto	
USB Controller	Enabled	
USB Keyboard Support	Disabled	
Init Display First	PCI Slot	
IDE HDD Block Mode	Enabled	
Onboard Lan Boot ROM	Disabled	
POWER ON Function	BUTTON ONLY	
KB Power On Password	Enter	
Hot Key Power On	Ctrl-F1	
Onboard FDC COntroller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
RxD, TxD Active	Hi, Lo	
IR Transmission delay	Enabled	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
EPP Mode Select	EPP1.7	
ECP Mode Use DMA	3	
PWRON After PWR-Fail	Off	
↑↓→← : Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

- **On-Chip Primary/Secondary PCI IDE**
  The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately.
  The choice: Enabled, Disabled.

- **IDE Primary/Secondary Master/Slave PIO**
  The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.
  The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

- **IDE Primary/Secondary Master/Slave UDMA**
  Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 98 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, select Auto to enable BIOS support.
  The Choice: Auto, Disabled.

- **USB Controller**
  Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.
  The choice: Enabled, Disabled.

- **USB Keyboard Support**
  Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.
  The choice: Enabled, Disabled.

- **Init Display First**
  This item allows you to decide to active whether PCI Slot or on-chip VGA first.
  The choice: PCI Slot, Onboard.

- **IDE HDD Block Mode**
  Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.
  The choice: Enabled, Disabled

- **POWER ON Function**
  This option allows users to select the type of power ON sequence for the system to follow. The default value is *"Button-Only"*.

BUTTON-ONLY	Follows the conventional way of turning OFF system power (via power button).
Password	Upon selecting this option, the KB POWER ON Password line appears. Press <Enter> and you'll be prompted to enter and confirm a password of your choice. After setting the password, succeeding attempts to power ON the system will result to null. For system to activate, user must input the password via keyboard then press <Enter>.
Hot KEY	This option is very similar with that of Password. Hot-key combinations range from Ctrl-F1 to Ctrl-F12. User may define this combination from the Hot key Power ON option.

- **KB Power ON Password**
  This item allows you to set the keyboard power on password.
- **Hot Key Power On**
  This item allows you to select the hot key of the keyboard power on.
  The choice: Ctrl-F1~F12.
- **Onboard FDC Controller**
  Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field.
  The choice: Enabled, Disabled.
- **Onboard Serial Port 1/Port 2**
  Select an address and corresponding interrupt for the first and second serial ports.
  The choice: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.
- **UART Mode Select**
  This item allows you to select UART mode.
  The choice: IrDA, ASKIR, Normal.
- **RxD, TxD Active**
  This item allows you to determine the active of RxD, TxD.
  The Choice: "Hi, Hi", "Lo, Lo", "Lo, Hi", "Hi, Lo".

- **IR Transmission delay**
  This item allows you to enable/disable IR transmission delay.
  The choice: Enabled, Disabled.

- **UR2 Duplex Mode**
  This item allows you to select the IR half/full duplex funcion.
  The choice: Half, Full.

- **Use IR Pins**
  This item allows you to select IR transmission routes, one is RxD2m, TxD2 (COM Port) and the other is IR-Rx2Tx2.
  The choice: IR-Rx2Tx2, RxD2,TxD2.

- **Onboard Parallel Port**
  This item allows you to determine access onboard parallel port controller with which I/O address.
  The choice: 3BC/IRQ7, 378/IRQ7, 278/IRQ5, Disabled.

- **Parallel Port Mode**
  Select an operating mode for the onboard parallel (printer) port. Select *Normal, Compatible,* or *SPP* unless you are certain your hardware and software both support one of the other available modes.
  The choice: SPP, EPP, ECP, ECP+EPP.

- **EPP Mode Select**
  Select EPP port type 1.7 or 1.9.
  The choice: EPP1.7, 1.9.

- **ECP Mode Use DMA**
  Select a DMA channel for the parallel port for use during ECP mode.
  The choice: 3, 1.

- **PWRON After PWR-Fail**
  This item allows you to select if you want to power on the system after power failure.
  The choice: Off, On, Former-Sts.

7.7 Power Management Setup

The Power Management Setup allows you to save energy of your system effectively. It will shut down the hard disk and turn OFF video display after a period of inactivity.

CMOS Setup Utility-Copyright © 1984-2001 Award Software
Power Management Setup

		Item Help
ACPI Function	Disabled	
ACPI Suspend Type	S1(POS)	
Run VGABIOS if S3 Resume	Auto	Menu Level ►
Power Management	Min Saving	
Video Off Method	DPMS	
Video Off In Suspend	Yes	
Suspend Type	Stop Grant	
MODEM Use IRQ	3	
Suspend Mode	1 Hour	
HDD Power Down	15 Min	
Soft-Off by PWR-BTTN	Instant-Off	
CPU THRM-Throttling	50.0%	
Wake-up by PCI card	Enabled	
Power On by Ring	Enabled	
USB KB Wakeup From S3(S4)	Disabled	
Resume by Alarm	Disabled	
Date(of Month) Alarm	0	
Time(hh:mm:ss) Alarm	0 : 0 : 0	
** Reload Global Timer Events **		
Primary IDE 0	Disabled	
Primary IDE 1	Disabled	
Secondary IDE 0	Disabled	
Secondary IDE 1	Disabled	
FDD, COM, LPT Port	Disabled	
PCI PIRQ[A-D]#	Disabled	

↑↓→← : Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **ACPI Function**
  This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI). The choice: Enabled, Disabled.

- **ACPI Suspend Type**
  This item allows you to select the APCI suspend type.
  S1 (POS) => Power On Suspend, S3 (STR) => Suspend To DRAM
  The choice: S1 (POS), S3 (STR).

- **Power Management**
  This item allows you to select the Power Management mode.
  The choice: User Define, Min Saving, Max Saving.

- **Video Off Method**
  In suspending, this item allows you to select the CRT closed method under APM mode.
  The choice: Blank Screen, V/H SYNC+Blank, DPMS

- **Video Off In Suspend**
  In suspending, this item allows you to select if you want to close the CRT under APM mode.
  The choice: Enabled, Disabled.

- **Suspend Type**
  This item allows you to select the suspend type. Stop Grant means wake up by IRQ, and PowerOn Suspend means wake up by ACPI wake up event.
  The choice: Stop Grant, PwrOn Suspend.

- **MODEM Use IRQ**
  APM 1.2 function used only.
  The choice: NA, 3, 4, 5, 7, 9, 10, 11

- **Suspend Mode**
  When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.
  The choice: Enabled, Disabled.

- **HDD Power Down**
  When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.
  The choice: Enabled, Disabled.

- **Soft-Off by PWR-BTTN**
  Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state when the system has "hung."
  The choice: Delay 4 Sec, Instant-Off.

- **CPU THRM-Throttling**
  Select the CPU THRM-Throttling rate.
  The choice: 12.5%, 25.0%, 37.5%, 50.0%, 62.5%, 75.0%, 87.5%.
- **Power On by Ring**
  An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.
  The choice: Enabled, Disabled.
- **USB KB Wakeup From S3 (S4)**
  This item will enable you to wake-up the system by USB keyboard when you shut down the computer in S3 mode.
  The choice: Enabled, Disabled.
- **Resume by Alarm**
  When *Enabled,* your can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.
  The choice: Enabled, Disabled.
- **Primary IDE 0** The default value is *"Disabled"*.
- **Primary IDE 1** The default value is *"Disabled"*.
- **Secondary IDE 0** The default value is *"Disabled"*.
- **Secondary IDE 1** The default value is *"Disabled"*.
- **FDD, COM, LPT Port** The default value is *"Disabled"*.
- **PCI PIRQ[A-D]#** The default value is *"Disabled"*.

7.8 PNP/PCI Configuration

This section describes configuring the PCI bus system. PCI, or

Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

CMOS Setup Utility-Copyright © 1984-2001 Award Software
PnP/PCI Configurations

		Item Help
PNP OS Installed	No	
Reset Configuration Data	Disabled	Menu Level ►
Resources Controlled By	Auto (ESCD)	
X IRQ Resources	Press Enter	Select Yes if you are using a Plug and play capable operating system select No if you need the BIOS to configure non-boot devices
X DMA Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	

↑↓→← : Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **PNP OS Installed**
  This item allows you to determine install PnP OS or not. The options available are Yes and No.

- **Reset Configuration Data**
  Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup or if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system can not boot. The options available are Enabled and Disabled.

- **Resource controlled by**
  The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows®98. The options available are Auto and Manual.

- **IRQ Resources**
  When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

- **PCI / VGA Palette Snoop**
  Leave this field at *Disabled*.
  The choice: Enabled, Disabled.

7.9 PC Health Status

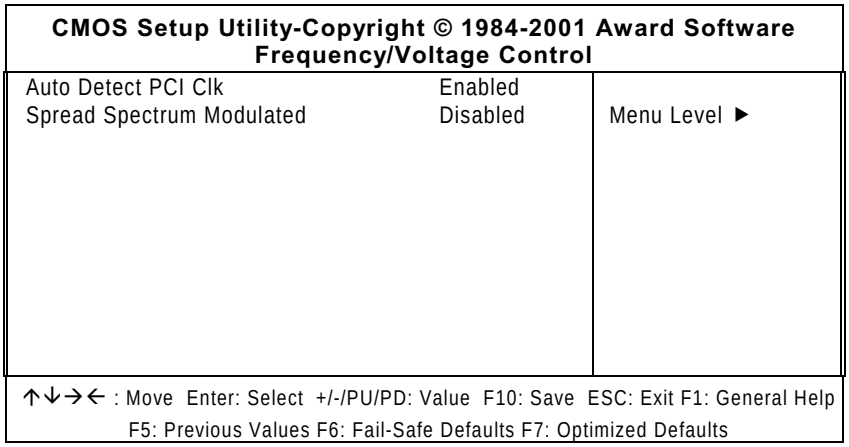
This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

CMOS Setup Utility-Copyright © 1984-2001 Award Software PC Health Status	
Current System Temp. Current CPU Temperature Current FAN1 Speed Current FAN2 Speed Cureent FAN3 Speed Vcore +3.3V +5V +12V -12V -5V	Menu Level ►
↑↓→← : Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults	

- **Current System Temp.**
  Show you the current system temperature.
- **Current CPU Temperature**
  Show you the current CPU1 temperature.
- **Current FAN1/FAN2/FAN3 Speed**
  These optional and read-only fields show the current speeds in RPM (revolution per minute) for the CPU fan and chassis fan as monitored by the hardware monitoring IC.
- **+3.3V/+5V/+12V/-12V/-5V**
  Show you the voltage of +3.3V/+5V/+12V/-12V/-5V.

7.10 Frequency/Voltage Control

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

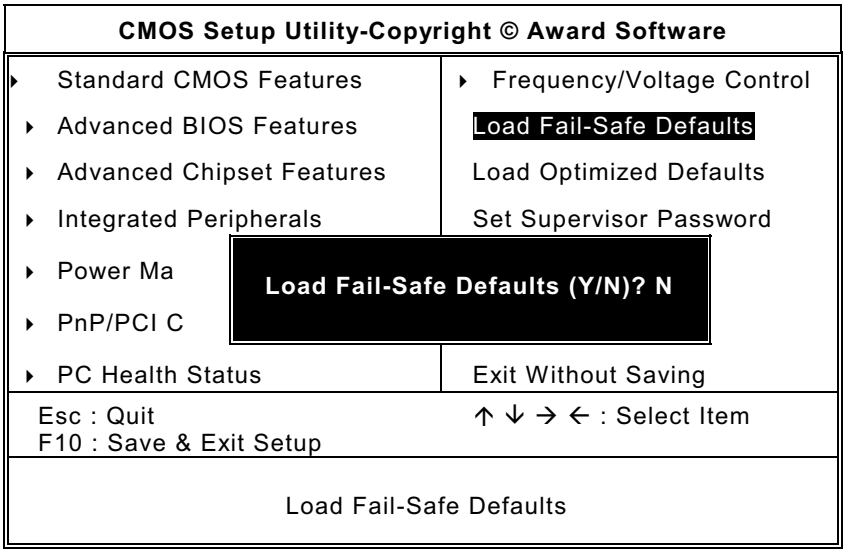

CMOS Setup Utility-Copyright © 1984-2001 Award Software
Frequency/Voltage Control
Auto Detect PCI Clk
Enabled
Spread Spectrum Modulated
Disabled
Menu Level ►
↑↓→← : Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **Auto Detect PCI Clk**
  When enabled, this item will auto detect if the DIMM and PCI socket have devices and will send clock signal to DIMM and PCI devices. When disabled, it will send the clock signal to all DIMM and PCI socket.
  The choice: Enabled, Disabled.

- **Spread Spectrum Modulated**
  This item allows you to enable/disable the spread spectrum modulate.
  The choice: Enabled, Disabled.

7.11 Load Fail-Safe Defaults

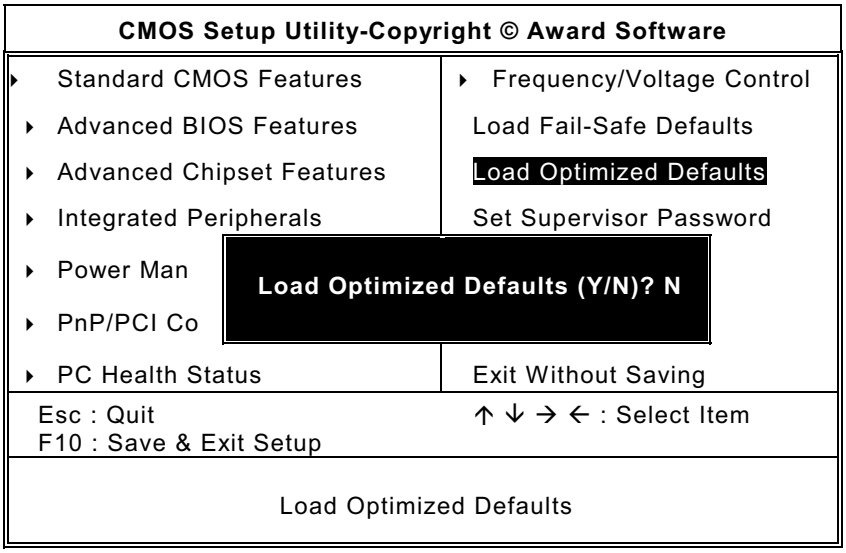
This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.



To load BIOS defaults value to CMOS SRAM, enter "Y". If not, enter "N".

7.12 Load Optimized Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.



To load SETUP defaults value to CMOS SRAM, enter “Y”. If not, enter “N”.

7.13 Set Supervisor/User Password

You can set either supervisor or user password, or both of then. The differences between are:

supervisor password: can enter and change the options of the setup menus.
user password: just can enter but do not have the right to change the options of the setup menus.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password with eight characters at most, and press <Enter>. The password typed will now clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable password, just press <Enter> when you are prompted to enter password. A message will confirm the password being disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

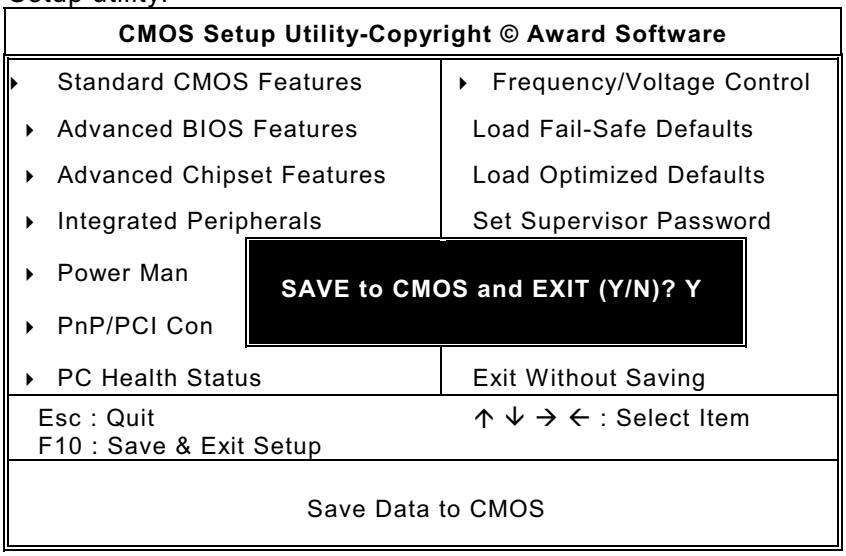
When a password is enabled, you have to type it every time you enter Setup. This prevents any unauthorized person from changing your system configuration.

Additionally when a password is enabled, you can also require the BIOS to request a password every time the system reboots. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password is required during boot up and entry into Setup. If set as "Setup", prompting will only occur prior to entering Setup.

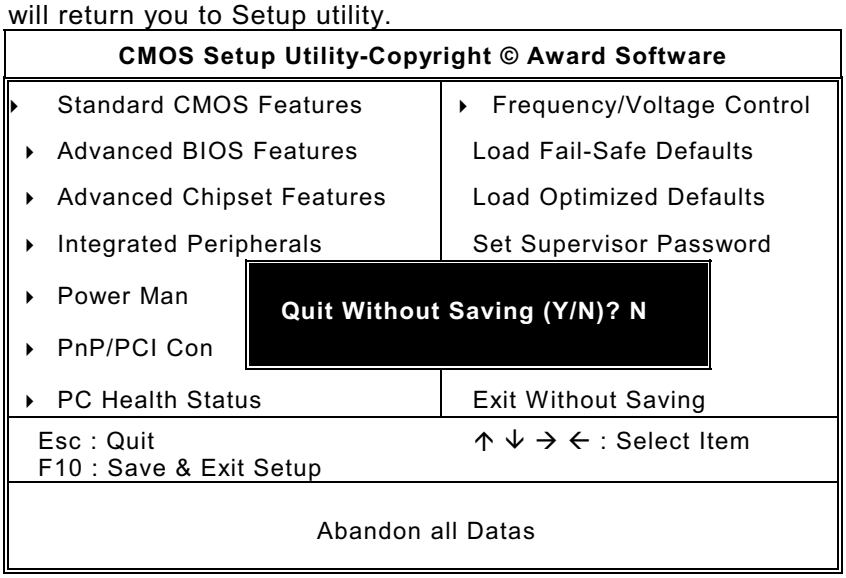
7.14 Save & Exit Setup

This allows you to determine whether or not to accept the modifications. Typing “Y” quits the setup utility and saves all changes into the CMOS memory. Typing “N” brigs you back to Setup utility.



7.15 Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing "Y" will quit the Setup utility without saving the modifications. Typing "N" will return you to Setup utility.



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Appendix A
Watchdog Timer

Using the Watchdog Function

The **SBC81820** CPU card uses version 2.0 of the watchdog timer. This onboard WDT generates either a system reset or non-maskable interrupt (NMI), depending on the settings made on jumper **JP12** of **SBC81820**. Follow the steps below to enable and program the watchdog function of **SBC81820**.

Start

↓

Un-Lock WDT	**:**	**OUT 120H 0AH ; enter WDT function** **OUT 120H 0BH ; enable WDT function**

↓

Set multiple (1~4)	**:**	**OUT 120 0NH ; N=1,2,3 or 4**

↓

Set base timer (0~F)	**:**	**OUT 121 0MH ; M=0,1,2,...F**

↓

WDT counting

↓

re-set timer	**:**	**OUT 121 0MH ; M=0,1,2,...F**

↓

IF No re-set timer	**:**	**WDT time-out, generate RESET or NMI**

↓

IF to disable WDT	**:**	**OUT 120 00H ; Can be disable at any time**

M	N			
	1	2	3	4
0	0.5 sec.	5 secs.	50 secs.	100 secs.
1	1 sec.	10 secs.	100 secs.	200 secs.
2	1.5 secs.	15 secs.	150 secs.	300 secs.
3	2 secs.	20 secs.	200 secs.	400 secs.
4	2.5 secs.	25 secs.	250 secs.	500 secs.
5	3 secs.	30 secs.	300 secs.	600 secs.
6	3.5 secs.	35 secs.	350 secs.	700 secs.
7	4 secs.	40 secs.	400 secs.	800 secs.
8	4.5 secs.	45 secs.	450 secs.	900 secs.
9	5 secs.	50 secs.	500 secs.	1000 secs.
A	5.5 secs.	55 secs.	550 secs.	1100 secs.
B	6 secs.	60 secs.	600 secs.	1200 secs.
C	6.5 secs.	65 secs.	650 secs.	1300 secs.
D	7 secs.	70 secs.	700 secs.	1400 secs.
E	7.5 secs.	75 secs.	750 secs.	1500 secs.
F	8 secs.	80 secs.	800 secs.	1600 secs.

Appendix B
Connector Pin Assignments

40-pin IDE Interface Connector: CN19/CN20

Pin	Description	Pin	Description	Pin	Description
1	Reset #	2	GND	3	Data 7
4	Data 8	5	Data 6	6	Data 9
7	Data 5	8	Data 10	9	Data 4
10	Data 11	11	Data 3	12	Data 12
13	Data 2	14	Data 13	15	Data 1
16	Data 14	17	Data 0	18	Data 16
19	GND	20	No connector	21	No connector
22	GND	23	IOW #	24	GND
25	IOR #	26	GND	27	IOCHRDY
28	No connector	29	No connector	30	GND-Default
31	Interrupt	32	No connector	33	SA1
34	No connector	35	SA0	36	SA2
37	HDC CS0 #	38	HDC CSI #	39	HDD Active #
40	GND				

Floppy Disk Connector: CN22

Pin	Description	Pin	Description	Pin	Description
1	GND	2	Reduce write current	3	GND
4	No connector	5	GND	6	No connector
7	GND	8	Index#	9	GND
10	Motor enable A#	11	GND	12	Drive select B#
13	GND	14	Drive select A#	15	GND
16	Motor enable B#	17	GND	18	Direction#
19	GND	20	STEP#	21	GND
22	Write data#	23	GND	24	Write gate#
25	GND	26	Track 0 #	27	GND
28	Write protect#	29	GND	30	Read data#
31	GND	32	Side 1 select#	33	GND
34	Disk change#				

Parallel Port Connector: CN1

Pin	Description	Pin	Description
1	Strobe#	14	Auto Form Feed#
2	Data 0	15	Error#
3	Data 1	16	Initialize#
4	Data 2	17	Printer Select In#
5	Data 3	18	GND
6	Data 4	19	GND
7	Data 5	20	GND
8	Data 6	21	GND
9	Data 7	22	GND
10	Acknowledge#	23	GND
11	Busy	24	GND
12	Paper Empty#	25	GND
13	Printer Select	26	

RS-422/485 pin assignments for COM2: CN6

Pin #	Signal Name	
	R2-422	RS-485
1	TX-	DATA-
2	No connector	No connector
3	TX+	DATA+
4	No connector	No connector
5	RX+	No connector
6	No connector	No connector
7	RX-	No connector
8	No connector	No connector
9	GND	GND
10	No connector	No connector

RS-232 Serial Ports Pin Assignment: CN2, CN6

CN2/CN6 Pin	Description
1	Data Carrier Detect (DCD)/5V/12V
2	Data Set Ready (DSR)
3	Receive Data (RXD)
4	Request to Send (RTS)
5	Transmit Data (TXD)
6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)
8	Ring Indicator (RI)/5V/12V
9	Ground (GND)
10	GND

USB Connector: CN4

Pin	Description	Pin	Description
1	USB Vcc	2	USB Vcc
3	USB P0-	4	USB P1-
5	USB P0+	6	USB P1+
7	GND	8	GND
9	No connector	10	No connector

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